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DECLINING FEDERAL HEALTH AND SAFETY STANDARDS: FIRE SAFETY

HEARING

BEFORE THE

SUBCOMMITTEE ON
INVESTMENT, JOBS, AND PRICES

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

NINETY-NINTH CONGRESS

SECOND SESSION

JULY 28, 1986

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DECLINING FEDERAL HEALTH AND SAFETY STANDARDS: FIRE SAFETY

MONDAY, JULY 28, 1986

Congress of the United States,
Subcommittee on Investment, Jobs, and Prices
of the Joint Economic Committee,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:45 a.m., in the Frederick County Commissioners' Hearing Room, 12 East Church Street, Frederick, Maryland, Hon. Paul S. Sarbanes (member of the subcommittee) presiding.

Present: Senator Sarbanes.

Also present: William Buechner, professional staff member.

OPENING STATEMENT OF SENATOR SARBANES, PRESIDING

Senator **Sarbanes**. Today, the Joint Economic Committee's Subcommittee on Investment, Jobs, and Prices meets to hear testimony on the consequences and economic implications of a diminished Federal role in fire prevention, research, and safety.

Our hearing today is the second in a series the subcommittee is holding on the status of a broad range of health and safety programs. The series began last week in Washington with a review of air transportation safety and will continue next week with an examination of child health and environmental issues. These hearings are prompted by a rising concern in the Congress, in the press, and the public at large that health and safety standards in a number of critical areas are being eroded by arbitrary budget cuts and in some cases by sweeping deregulation and the interplay between the two.

In July 1984, a study published by former Deputy Administrator of the Environmental Protection Agency, William Drayton, concluded that, where health and safety are concerned, the Federal Government is "failing pretty much across the board, irrespective of program or government agency" and that the Administration's chief policy weapon toward this end, budget cuts, "have fallen most unrelentingly on the relatively new and more vulnerable health and safety agencies."

These comments of Mr. Drayton's most certainly apply to Federal fire prevention and control programs. Fire prevention and control had historically been only a State and local responsibility. But the 1973 blue-ribbon report, entitled "America Burning," underscored the unacceptably high rates of death, injury, and property loss from fire in this country. At that time, the United States had the world's highest rate of fire deaths per capita, and the report called for a Federal role in fire protection. Congress responded, and I remember this well because I was involved in the effort, by passing the Federal Fire Prevention and Control Act of 1974 for the purpose of providing Federal support to local communities' fire prevention and control efforts.

The act established several programs, including the U.S. Fire Administration, the National Fire Academy, and the Center for Fire Research in the National Bureau of Standards. Since passsage of the act, loss of life by fire in this country has declined 30 percent. Property losses due to fire have declined dramatically during this period, saving approximately $5 billion in property. Firefighter deaths in the line of duty have also decreased, although at a slower rate and, in my view, much remains to be done in this particular area.

Notwithstanding these encouraging trends, deep cuts have been proposed in the past several years in the budgets of the U.S. Fire Administration, the Center for Fire Research at the National Bureau of Standards in Gaithersburg and the National Fire Academy here in Frederick County in Emmitsburg. Indeed, for the past 4 years the Administration has recommended elimination of some of these programs. The current budget request proposes to eliminate the U.S. Fire Administration and to reduce the National Fire Academy budget by nearly one-fourth.

Congress has consistently refused to approve the Administration's requests. Nonetheless, a number of other factors threaten to erode significantly future Federal support for fire safety and protection. Among them are the effects of Gramm-Rudman, the impending elimination of general revenue sharing, which many municipalities have used effectively for fire protection, and reduction or delays in the fire regulatory efforts of the Consumer Product Safety Commission and other Federal agencies which are part of the Administration's program to reduce all aspects of Federal regulation.

Our purpose today is to review the Federal contribution over the past 12 years to improve fire protection and then look to the job that lies ahead. The first question is the record of the past dozen years and the cost effectiveness of our fire safety programs. Looking to the future, we must consider other equally important questions, among them:

What is the relationship between our investment in research and the long-term effectiveness of fire safety programs?

What would the Nation stand to lose if the Administration's proposals to reduce and eliminate these programs were approved?

Who will assume the responsibilities now borne by the Federal Government if the Federal role is substantially diminished?

Is there more that could or should be done to reduce the loss of life, injury, and property damage from fire?

In this connection, it should be remembered that despite the very major improvement in our fire safety record, some 6,000 persons die and 100,000 more are injured nationwide in fires every year. It helps to put these figures in perspective if we recall that the annual death toll from fire is nearly 20 times the number of deaths caused by all other kinds of natural disasters combined. It is also sobering to remember the dimensions of financial loss—over $6 billion annually in property damage.

This hearing will seek to build a record that we can carry back to our colleagues in Washington to substantiate the need for the continuation of these programs. We are fortunate to have with us today very knowledgeable and experienced witnesses who appear before the subcommittee in three panels. First, we will have a panel of State and local fire officials, then a panel of representatives of fire service organizations, and finally, a panel of individual experts.

The witnesses on the first panel, and I'd ask them to come forward and take their seats, are Rocco Gabriele, the Maryland State Fire Marshal, John Frazier, bureau chief of the Baltimore City Fire Department, and John Droneburg, regional coordinator of the Maryland Fire and Rescue Institute, who has also been asked to represent here today at this hearing the Federick County Commissioners and the Federick County Fire and Rescue Association.

Gentlemen, we'll proceed in the order in which you came to the table. Your entire statement will be included in the record as submitted and you may proceed as you choose. You can summarize it or abridge it if you choose to do so.

Please proceed, Mr. Gabriele.

STATEMENT OF ROCCO J. GABRIELE, MARYLAND STATE FIRE MARSHAL

Mr. GABRIELE. Mr. Chairman, members of the committee, it's an honor and pleasure for me to have the opportunity to appear before you today. I bring you greetings from Governor Harry Hughes, Secretary Frank Hall of the Department of Public Safety and Correctional Services, Mr. C. Oscar Baker, the chairman of the Maryland State Fire Prevention Commission, and the officers and staff of the Office of the Maryland State Fire Marshal.

You have a copy of my prepared statement, of which I will highlight just a few of the activities and programs that Federal general revenue sharing funds have accomplished for over a decade.

I believe the role of the Federal Government is to support the fire services of the State and local governments, not to supplant that service. State and local governments accept the primary responsibility to provide the day-to-day services necessary to address the fire problems. The reason that I am here today is to express my concern as a fire marshal for the State of Maryland that the Federal general revenue sharing funds for the Federal programs that support State and local fire services are about to be drastically reduced. If funding for these programs is allowed to be decreased, I fear that all that has been accomplished with Federal support will go for naught.

The programs that I am concerned about are in the area of fire prevention, fire safety education, fire research, arson prevention, and fire data collection.

Federal revenue sharing funds originally utilized through the U.S. Fire Administration and now through the parent organization, the Federal Emergency Management Agency, have been responsible for the research and development, for example, that brought about the early warning devices we now know that are so important—smoke detectors. As a result of this accomplishment, fire deaths in the United States have decreased from approximately 9,000 deaths in the 1970's to 6,000 deaths in the 1980's, a decrease of 33 percent in just over a 10-year period.

Further research has led to the development of the quick response residential sprinkler systems. This new phenomenon, once totally accepted, will result in a further decrease in fire deaths, we believe, by as much as 50 percent.

Programs formulated and presented at the National Fire Academy right here in Frederick County, Maryland, in the community of Emmitsburg, have been responsible for training tens of thousands of firefighters and fire administrators from across the United States in fire prevention, fire safety, fire service administration, hazardous material identification, arson recognition, arson detection, and fire data management, to mention just a few. All of these programs are specialized programs and courses that support State and local programs.

Training programs must continue to be available to all personnel of the fire service. These programs are used to bring the latest information and techniques to a profession that is still considered one of the most dangerous in the country.

Research must be continued to discover the ramifications of toxicity and material flammability, for example. Firefighters are still suffering from long-term illnesses and, yes, death, as a result of toxic byproducts of combustion.

If my figures are correct, the proposed budget for the Federal Emergency Management Agency indicates funding for 1987 at $462.2 million, or a decrease of $393.5 million below the 1986 budget. The U.S. Fire Administration has been zero budgeted and the budget for the National Fire Academy has been decreased by $2.6 million for 1987. In fact, the total proposed decrease for training and fire programs is $15.3 million from the 1986 budget of $50.8 million. So that the proposed 1987 budget reflects a total of $35.5 million.

This budget proposal equates to a dramatic decrease in the amount of support that will be available to State and local government fire services. It will decrease the research dollars necessary for the Center for Fire Research and the National Bureau of Standards to continue their studies in toxicity and material flammability and the other programs that they are now working on.

Therefore, I ask this committee to oppose the prospective decreases in the budget for training and fire programs and to urge your distinguished colleagues in the Congress to continue Federal general revenue sharing funds at the 1986 level and to insist that the Federal Government continue to accept the responsibility to support State and local government fire services as Congress did over 10 years ago when it adopted the recommendations of the National Commission on Fire Prevention and Control.

Thank you, sir.

[The prepared statement of Mr. Gabriele, together with an attachment, follows:]

PREPARED STATEMENT OF ROCCO J. GABRIELE

IN 1971 THE U.S. CONGRESS FUNDED THE NATIONAL COMMISSION ON FIRE PREVENTION AND CONTROL TO STUDY FIRE PROBLEMS IN THE UNITED STATES AND MAKE RECOMMENDATIONS "WHEREBY THE NATION CAN REDUCE THE DESTRUCTION OF LIFE AND PROPERTY CAUSED BY FIRE IN THE CITIES, SUBURBS, COMMUNITIES, AND ELSEWHERE". THE ENABLING LEGISLATION WAS NOT RESTRICTIVE IN SCOPE AND DEFINED SEVERAL AREAS SUCH AS: TECHNOLOGICAL ADVANCES, CONSTRUCTION TECHNIQUES AND IMPROVED INSPECTION PROCEDURES THAT WOULD PREVENT FIRES EFFECTIVELY, TRAINING, IMPROVEMENT OF FIRE FIGHTING EQUIPMENT AND STANDARDIZATION, JUST TO MENTION A FEW.

THE COMMISSION ESTABLISHED A GOAL OF 50% REDUCTION IN DEATHS, INJURIES AND FIRE LOSSES OVER TEN YEARS OR 5% PER YEAR. TO THIS END THE COMMISSION MADE MANY RECOMMENDATIONS. AMONG THEM WERE: TO ESTABLISH A U.S. FIRE ADMINISTRATION TO PROVIDE A NATIONAL FOCUS FOR THE NATIONS FIRE PROBLEM AND TO PROMOTE A COMPREHENSIVE PROGRAM WITH ADEQUATE FUNDING TO REDUCE LIFE AND PROPERTY LOSS FROM FIRE; THAT A NATIONAL FIRE DATA SYSTEM BE ESTABLISHED TO PROVIDE A CONTINUING REVIEW AND ANALYSIS OF THE ENTIRE FIRE PROBLEM; PROVIDE SUPPORT FOR RESEARCH AND DEVELOPMENT IN EARLY WARNING DETECTION SYSTEM AND IMPROVED AUTOMATIC SUPPRESSION SYSTEMS; DEVELOP A PROGRAM WITH ADEQUATE FUNDING TO ASSIST, AUGMENT AND EVALUATE EXISTING PUBLIC AND PRIVATE FIRE SAFETY EDUCATION EFFORTS. THESE ARE BUT A FEW OF THE MANY RECOMMENDATIONS MADE BY THE COMMISSION OVER A DECADE AGO.

BY AND LARGE OVER THAT DECADE OR SO, SOME OF THESE RECOMMENDATIONS WERE FOLLOWED. THE UNITED STATES FIRE ADMINISTRATION AND THE NATIONAL FIRE ACADEMY BECAME A REALITY. THE U.S. FIRE ADMINISTRATION DID THE RESEARCH AND DEVELOPMENT THAT BROUGHT ABOUT THE EARLY DETECTION SYSTEM. THIS SYSTEM OF HARD WIRED AND BATTERY OPERATED SMOKE DETECTORS WAS INITIALLY RESPONSIBLE FOR THE REDUCTION

IN FIRE DEATHS BY APPROXIMATELY 33% SINCE THEY HAVE BEEN IN USE. IN MARYLAND LEGISLATION WAS PASSED REQUIRING SMOKE DETECTORS IN ALL RESIDENTIAL UNITS. IN THIS ENDEAVOR ALONE THE SIGNIFICANCE OF FEDERAL, STATE, COUNTY, AND LOCAL GOVERNMENTS CAN BE MEASURED BY THE ACTUAL REDUCTION IN FIRE DEATHS. NATIONWIDE THE FIGURE DROPPED FROM APPROXIMATELY 9000 DEATHS TO APPROXIMATELY 6000 DEATHS PER YEAR. IN THE STATE OF MARYLAND WE EXPERIENCED A DROP IN FIRE DEATHS FROM A HIGH OF 178 IN 1975 TO 127 RECORDED IN 1985. IN THE CITY OF BALTIMORE FIRE DEATHS DROPPED FROM A HIGH OF 66 IN 1981 TO 43 IN 1985.

DURING RECENT YEARS, SINCE APPROXIMATELY 1978, THE FIRE SERVICE HAS BEEN EXPLORING NEW AND MORE EFFICIENT WAYS TO SAVE LIVES AND PROPERTY FROM THE RAVAGES OF FIRES THROUGH TECHNOLOGICAL DEVELOPMENTS. ONE SUCH DEVELOPMENT IS COMMONLY REFERRED TO AS A RESIDENTIAL QUICK RESPONSE SPRINKLER SYSTEM. MUCH OF THIS RESEARCH HAS BEEN PROVIDED THROUGH THE U.S. FIRE ADMINISTRATION, PARTICULARLY DURING THE 1970'S AND 1980'S, THROUGH THE FORMER ACTING ADMINISTRATOR, MR. HARRY SHAW. FEDERAL RESEARCH HAS SHOWN, FOR EXAMPLE, THAT WITH THE COMBINATION OF AUTOMATIC SPRINKLER SYSTEMS AND SMOKE DETECTION SYSTEMS IN ALL BUILDINGS AND RESIDENCES, LOSS OF LIFE AND OVERALL INJURIES CAN BE REDUCED BY AS MUCH AS 50%.

NATURALLY, THE IDEAL WAY TO REDUCE FIRE DEATHS AND LOSSES IS TO PREVENT FIRES COMPLETELY BUT THIS SOLUTION IS IMPRACTICAL. AS LONG AS THERE ARE MEN, WOMEN AND CHILDREN THERE WILL ALWAYS BE SOME FORM OF A FIRE PROBLEM. RESEARCH CONDUCTED THROUGHOUT THE COUNTRY AND FOR THAT MATTER, THE WORLD, IS SHOWING US THAT RESIDENTIAL SPRINKLER SYSTEMS AT THIS POINT IN TIME ARE PROBABLY THE BEST ANSWER FOR RESIDENTIAL FIRE PROTECTION AND LIFE SAFETY ALONG WITH THE WELL TRAINED AND WELL EQUIPPED FIREFIGHTER.

RESIDENTIAL QUICK RESPONSE SPRINKLERS ARE OFTEN REFERRED TO AS THE 80 PERCENT SOLUTION TO OUR FIRE PROBLEMS. WE IN THE FIRE SERVICE AGREE THAT TO MINIMIZE FIRE DEATHS AND FIRE DAMAGE, FIRES MUST BE DETECTED AND SUPPRESSED WHILE

THEY ARE STILL IN THEIR INCIPIENT STAGE. IF A FIRE IS NOT EXTINGUISHED DURING ITS INITIAL PHASE, HEAT, FLAMES, CARBON MONOXIDE AND OTHER TOXIC GASSES WILL KILL EVERY OCCUPANT OF A ROOM WITHIN MINUTES. IN 1985, 127 MARYLANDER'S DIED AS A RESULT OF FIRES. OF THAT NUMBER, 52 PERCENT, OR 66 PEOPLE, DIED AS A RESULT OF ASPHYXIATION, 35.4 PERCENT, OR 44 PEOPLE, DIED AS A RESULT OF SEVERE BURNS AND 12.6 PERCENT, OR 16 OTHERS, DIED FROM A COMBINATION OF CAUSES. THE VAST MAJORITY OF OUR FIRE DEATHS, A TOTAL OF 103 MARYLANDER'S, DIED IN EITHER APARTMENT OR HOME FIRES. IF RESIDENTIAL SPRINKLER SYSTEMS WERE INSTALLED IN JUST THESE TWO OCCUPANCIES, LESS THAN 50 MARYLANDER'S WOULD HAVE DIED AS A RESULT OF FIRES THIS PAST YEAR.

THE FEDERAL GOVERNMENT CAN ASSIST US IN REDUCING FIRES AND FIRE DEATHS BY PROVIDING THE STATES AND LOCAL GOVERNMENTS WITH FUNDS FOR FURTHER FIRE RESEARCH IN THE AREAS OF BUILDING MATERIALS AND FURNISHINGS AND TOXICITY AS WELL AS FUNDS FOR FEDERAL HOUSING AND URBAN DEVELOPMENT RESIDENTIAL PROPERTIES TO BE EQUIPPED WITH QUICK RESPONSE RESIDENTIAL SPRINKLER SYSTEMS.

AS PRESIDENT REAGAN ONCE POINTED OUT, THE NEW "QUICK REACTION SPRINKLER SYSTEM IS A SIGNIFICANT ACHIEVEMENT BECAUSE IT WILL PLAY A MAJOR ROLE IN REDUCING LOSS OF LIFE AND PROPERTY FROM FIRES". I AGREE WITH PRESIDENT REAGAN'S COMMENT AND WE IN THE FIRE SERVICE ENDORSE THIS POSITION, BUT WE MUST HAVE FEDERAL ASSISTANCE AND FUNDING TO CONTINUE THIS EFFORT.

THE NATIONAL FIRE ACADEMY BECAME A REALITY AND IS HOUSED RIGHT HERE IN FREDERICK COUNTY, MARYLAND AT THE SITE OF THE FORMER ST. JOSEPHS COLLEGE CAMPUS IN EMMITSBURG. THIS ACADEMIC SETTING HAS PROVIDED THE NATIONAL FOCUS NECESSARY TO PROVIDE STANDARDIZED PROGRAMS AND TRAINING TO MEMBERS OF THE FIRE SERVICE. CONSEQUENTLY, LITERALLY TENS OF THOUSANDS OF FIREFIGHTERS AND FIRE SERVICE ADMINISTRATORS HAVE TAKEN ADVANTAGE OF THE EXCELLENT PROGRAMS PROVIDED. THE FACT THAT THESE PROGRAMS WERE FEDERALLY SUBSIDIZED PLAYED AN EXTREMELY LARGE

ROLE IN THE NUMBER OF PERSONNEL IN THE FIRE SERVICE WHO WERE ABLE TO TAKE ADVANTAGE OF THIS OPPORTUNITY. EVEN THOUGH MANY FIRE SERVICE PERSONNEL HAVE TAKEN ADVANTAGE OF THIS OPPORTUNITY, IT MUST BE ALLOWED TO CONTINUE SIMPLY BECAUSE THERE ARE STILL AN UNTOLD NUMBER OF PERSONNEL WHO ARE IN DIRE NEED OF THE TRAINING YET THEY CANNOT AFFORD TO GO AT THEIR OWN EXPENSE AND IN MANY CASES THE FIRE DEPARTMENT CANNOT AFFORD TO ALLOCATE THE FUNDS NECESSARY TO HAVE THEIR PERSONNEL ATTEND. NEEDLESS TO SAY, FAILURE TO CONTINUE THE FEDERAL SUBSIDY FOR TRAINING AT THE NATIONAL ACADEMY WILL NOT ONLY BRING ABOUT THE DEMISE OF THE NATIONAL FIRE ACADEMY BUT WILL STIFLE ONE OF THE MOST IMPORTANT CONTRIBUTIONS EVER MADE TO THE FIRE SERVICE BY THE FEDERAL GOVERNMENT, NOT TO MENTION WHAT IT WILL DO TO THE ECONOMY OF THE TOWN OF EMMITSBURG, TO FREDERICK COUNTY AND THE STATE OF MARYLAND IN THE LOSS OF JOBS AND VARIOUS REVENUES CREATED BY THIS TYPE OF FACILITY.

IN 1984, THE FEDERAL EMERGENCY MANAGEMENT AGENCY, WORKING IN CONJUNCTION WITH THE U.S. FIRE ADMINISTRATION AND THE NATIONAL SOCIETY OF FIRE SERVICE INSTRUCTORS, BEGAN THE NATIONAL COMMUNITY VOLUNTEER FIRE PREVENTION PROGRAM (NCVFPP) "PARTNERSHIPS AGAINST FIRE". UNDER THE AUTHORITY OF THE FEDERAL FIRE PREVENTION AND CONTROL ACT OF 1974, THE NCVFPP BEGAN WITH TEN STATES IN 1984 AND HAS SPREAD TO TWENTY STATES IN 1985, ONE OF WHICH IS THE STATE OF MARYLAND. THE NCVFPP IS INTENDED TO INCREASE THE EFFECTIVENESS OF LOCAL FIRE PREVENTION EFFORTS THROUGH THE COOPERATION AND UTILIZATION OF STATE, LOCAL AND FEDERAL RESOURCES. THIS PROGRAM ALSO ENHANCES PRIVATE SECTOR INVOLVEMENT IN FIRE SAFETY AND FIRE PREVENTION EFFORTS.

THE STATE OF MARYLAND WAS SELECTED THROUGH AN ANALYSIS OF OUR NATIONS'S FIRE PROBLEMS AND STATE'S FIRE PROBLEMS WITH CONSIDERATION GIVEN TO THE FACTORS OF:

A) RISK OF FIRE DEATH PER MILLION IN POPULATION; AND,

B) RISK OF FIRE DEATH PER THOUSAND OF FIRES.

THE PROGRAM AS INITIATED BY THE U.S. FIRE ADMINISTRATION WAS THE FIRST SUCH CONCENTRATED FEDERAL EFFORT TO COMBINE THE RESOURCES OF GOVERNMENT AT ALL LEVELS WITH THOSE OF THE FIRE SERVICE, COMMUNITY VOLUNTEERS AND THE PRIVATE SECTOR TO BUILD AND SUPPORT SUCCESSFUL FIRE SAFETY EDUCATIONAL PROGRAMS AT THE STATE AND LOCAL LEVELS. THIS PROGRAM, IN EACH OF THE STATES, WAS TO CONTINUE FOR A THREE YEAR PERIOD ASSISTED BY FEDERAL FUNDS, AFTER WHICH TIME THE PROGRAM WOULD EITHER BE SELF-SUPPORTING OR BE HEAVILY SUPPORTED BY PRIVATE SECTOR INVOLVMENT... ADDITIONALLY, THE OTHER THIRTY STATES IN THE NATION WOULD BE PLACED INTO THIS PROGRAM BY THE END OF THIS DECADE AND THEY ALSO WOULD BE DEVELOPING PROGRAMS AT THE LOCAL LEVEL TO HELP SOLVE OUR FIRE PROBLEMS IN THE UNITED STATES.

HOWEVER, WITH PROPOSED CUTS IN FUNDING, THE ECONOMIC IMPACT APPEARS TO BE QUITE SEVERE ON THIS HIGHLY SPECIALIZED AND VALUABLE PROGRAM. WE IN MARYLAND, FOR INSTANCE, HAVE BEEN ADVISED THAT THE THIRD YEAR OF OUR THREE YEAR NCVFPP IS IN GRAVE JEOPARDY AND THAT IF WE CANNOT FIND EITHER STATE FUNDING OR PRIVATE SECTOR FUNDING BY JULY, 1987, THEN THE FEDERAL EFFORTS OF THE NCVFPP IN MARYLAND WILL BE SEVERELY HINDERED.

PRESENTLY, WE HAVE THREE OUTSTANDING NCVFPP PROJECTS UNDERWAY IN OUR STATE AMOUNTING TO APPROXIMATELY $60,000 THIS PAST YEAR IN FEDERAL ASSISTANCE. THESE PROGRAMS ARE FIRE SAFETY FOR THE ELDERLY PROJECT CONDUCTED BY THE SOROPTIMIST CLUB OF FREDERICK COUNTY, EARLY CHILDHOOD EDUCATION DEVELOPMENT PRODUCED BY THE MARYLAND COMMITTEE FOR THE EDUCATION OF YOUNG CHILDREN AT THE UNIVERSITY OF MARYLAND IN PRINCE GEORGE'S COUNTY AND EARLY CHILDHOOD EDUCATION THROUGH THE LEARN NOT TO BURN CURRICULUM IN ST. MARY'S COUNTY. ALL OF THESE PROGRAMS, I FEEL, WILL HAVE A DEFINITE IMPACT IN FUTURE YEARS ON THE SEVERITY OF THE FIRE AND BURN PROBLEMS IN THE STATE OF MARYLAND. ADDITIONALLY, WE HOPE TO BE ABLE TO REPLICATE THESE PROGRAMS IN OTHER COUNTIES IN OUR STATE AND ALSO SHARE THESE

PROGRAMS WITH OTHER STATES AS WELL.

SHOULD WE FALL SHORT OF FEDERAL FUNDING FOR THE THIRD YEAR OF OUR PROGRAM, THE TRUE SUCCESS AND GOALS OF THE NCVFPP IN MARYLAND MAY NEVER BE FULLY REALIZED.

THE CONCEPT OF COMMUNITY-WIDE FIRE SAFETY PROGRAMS IS TO STIMULATE CITIZEN INVOLVEMENT. IT IS QUITE CLEAR THAT FIRE PROBLEMS BEGIN AT THE LOCAL LEVEL, BUT THE LOCAL FIRE SYSTEM ALONE CANNOT CONTROL THE RISING INCIDENTS OF FIRE THAT DAILY DESTROY LIVES AND PROPERTY THROUGHOUT THIS STATE AND NATION WITHOUT FEDERAL ASSISTANCE TO HELP FUND EDUCATIONAL PROGRAMS, RESEARCH PROGRAMS AND INFORMATION COLLECTION PROGRAMS.

DURING THE 1986 GENERAL ASSEMBLY, THE MARYLAND LEGISLATURE PASSED LEGISLATION WHICH REQUIRES AS OF JULY 1, 1986 FOR THE STATE FIRE PREVENTION COMMISSION AND STATE FIRE MARSHAL TO PRODUCE SEMINARS AND CONFERENCES ON FIRE SAFETY EDUCATION AND PREVENTION PROGRAMS. FOR MANY YEARS, OUR STATE AND, IN PARTICULAR, THE OFFICE OF THE STATE FIRE MARSHAL, HAS PRODUCED THE MARYLAND FIRE SAFETY SYMPOSIUM, PREVIOUSLY REFERRED TO AS THE GOVERNOR'S STATE-WIDE CONFERENCE ON FIRE PREVENTION. BUT WE HAVE FOUND, AND HAVE REALIZED FOR SEVERAL YEARS, THAT A ONCE A YEAR OR TWICE A YEAR FIRE SAFETY SYMPOSIUM CANNOT IDENTIFY AND SOLVE OUR VARIOUS FIRE PROBLEMS IN THIS STATE. WITH THIS PASSAGE OF THIS LEGISLATION, WE HOPE TO INCREASE STATE FUNDING FOR FIRE SAFETY EDUCATIONAL MATTERS BUT, WE MUST WORK WITH FEDERAL ASSISTANCE TO TRULY ACHIEVE OUR PARTNERSHIP AGAINST FIRE.

THE STATE OF MARYLAND WAS ONE OF THE FIRST STATES IN THE NATION TO PARTICIPATE IN THE NATIONAL FIRE INCIDENT REPORTING SYSTEM. TODAY, MARYLAND UNDERWRITES THE COST OF THE MARYLAND FIRE INCIDENT REPORTING SYSTEM FROM THE GENERAL FUND OF THE OFFICE OF THE STATE FIRE MARSHAL AT APPROXIMATELY $150,000 PER YEAR WITH APPROXIMATELY 99 PERCENT OF ALL THE FIRE DEPARTMENTS IN THE STATE PARTICIPATING. I BROUGHT WITH ME TODAY COPIES OF THE ANNUAL FIRE REPORT PREPARED BY THE OFFICE OF THE STATE FIRE MARSHAL TITLED "FIRE IN MARYLAND, 1985". THE INFORMATION

CONTAINED IN THIS REPORT COMES FROM THE FIRE COMPANIES PARTICIPATING IN THE REPORTING SYSTEM. THIS INFORMATION IS THEN FORWARDED TO THE NATIONAL FIRE INCIDENT REPORTING SYSTEM.

SINCE THE REPORT AMERICA BURNING WAS WRITTEN FIRE RESEARCH HAS BECOME VITAL TO UNDERSTANDING FIREFIGHTER SAFETY ISSUES AND HELPING TO CREATE A MORE FIRE SAFE LIVING ENVIRONMENT FOR OUR CITIZENS.

SOME OF THE MOST IMPORTANT HAZARDS IN OUR ENVIRONMENT ARE NOT COVERED BY BUILDING CODES. FIRE SAFETY REQUIREMENTS OF SUCH CODES APPLY MOSTLY TO CONSTRUCTION MATERIALS AND INTERIOR MATERIALS USED ON WALLS AND CEILINGS. THESE CODES GENERALLY SPEAKING DO NOT APPLY TO THE ACTUAL FURNISHINGS PLACED IN RESIDENTIAL OCCUPANCIES SUCH AS HOTELS, MOTELS, OR APARTMENT BUILDINGS. MOREOVER, SELDOM DO FIRE CODES APPLY TO PRIVATE DWELLINGS.

WHILE FURNISHINGS ARE LIKELY TO REMAIN OUTSIDE OF CODE PROVISIONS, THEY IN FACT CONTRIBUTE SIGNIFICANTLY TO COMBUSTION HAZARDS.

WITH THE EXCEPTION OF APPLIANCES SUCH AS COFFEE MAKERS, ELECTRIC IRONS AND PORTABLE HEATERS TO MENTION JUST A FEW, THERE ARE FEW MATERIALS THAT GO INTO RESIDENTIAL OCCUPANCIES WITH SOME FORM OF FIRE RESEARCH VERIFYING THEIR SAFETY.

THE CONSUMER PRODUCT SAFETY COMMISSION CREATED IN THE EARLY 1970'S HAS BEEN TESTING CERTAIN PRODUCTS AND MATERIALS THAT GO INTO RESIDENTIAL ENVIRONMENT. THIS COMMISSION HAS PROVED EXTREMELY VALUABLE TO US IN MARYLAND OVER THE PAST SEVERAL YEARS IN THE EXAMINATION OF CERTAIN PRODUCTS THAT HAVE BEEN FOUND TO CAUSE FIRES. HOWEVER THIS COMMISSION HAS ALSO BEEN FACED WITH BUDGET CUTS, WHICH ULTIMATELY ALTERS THEIR EFFECTIVENESS AND VALUE.

THE MARYLAND STATE FIRE MARSHAL'S OFFICE URGES THIS COMMITTEE TO REVERSE ANY PROPOSED CUTS IN FIRE RESEARCH - EITHER AT THE CENTER FOR FIRE RESEARCH AT THE NATIONAL BUREAU OF STANDARDS OR THE CONSUMER PRODUCT SAFETY COMMISSION. THE

HAZARDS OF MATERIALS IN OUR LIVING ENVIRONMENTS WILL NEVER BE COMPLETELY ELIMINATED. EARLY WARNING DETECTION AND ALARM SYSTEMS COUPLED WITH AUTOMATIC SPRINKLERS ARE HELPING US TO DEAL WITH THESE HAZARDS IN A FIRE SITUATION. HOWEVER, I DO NOT FEEL THAT WE CAN OR SHOULD RELY ON THESE VARIOUS SYSTEMS TO PROTECT US. CONTINUED RESEARCH AND FLAMMABILITY STUDIES NEED TO BE CONTINUED AND EXPANDED BY THE CENTER FOR FIRE RESEARCH AT THE NATIONAL BUREAU OF STANDARDS IN AN EFFORT TO SEE NATIONAL STANDARDS IMPLEMENTED FOR THE FUTURE DEVELOPMENT OF FIRE - SAFE FURNISHINGS. FOR DETECTION AND SUPPRESSION SYSTEMS WITHOUT IMPROVING THE FIRE SAFETY ASPECTS OF FURNISHINGS LEAVES A GAP IN THE PROTECTION OF OUR CITIZENS THAT CAN AND PROBABLY WILL LEAD TO FUTURE DISASTERS.

I AM CONCERNED AS THE FIRE MARSHAL FOR THE STATE OF MARYLAND THAT THE RECENT ENACTMENT OF THE GRAMM-RUDMAN BILL, THE PROPOSED ELIMINATION OF GENERAL REVENUE SHARING FUNDS AND THE FUTURE EROSION OF FEDERAL SUPPORT WILL SERIOUSLY IMPACT ON FIRE SAFETY, FIRE PROTECTION AND FIRE PREVENTION PROGRAMS THROUGHOUT THE STATE OF MARYLAND. THE ELIMINATION OR THE REDUCTION, FOR THAT MATTER, OF GENERAL REVENUE SHARING FUNDS WILL REQUIRE STATE AND LOCAL GOVERNMENTS TO RELY SOLELY UPON BUDGET ALLOCATIONS FROM THEIR RESPECTIVE JURISDICTIONS. IN MANY CASES, THE ELIMINATION OR REDUCTION IN FUNDING ON THE FEDERAL LEVEL WILL MEAN THE REDUCTION OF SERVICES, THE ELIMINATION OF PLANNED FIRE SAFETY AND/OR FIRE PREVENTION PROGRAMS AND THE REDUCTION IN TRAINING COURSES AVAILABLE TO FIRE SERVICE PERSONNEL IN MARYLAND. BUT MORE IMPORTANTLY, THE REALITY OF THE LOSS OF FEDERAL GENERAL REVENUE SHARING FUNDS IS THAT THE EXCELLENT RECORD ACHIEVED IN THE REDUCTION OF THE LOSS OF LIFE AND PROPERTY FROM FIRE WILL BE IMPACTED. THE NUMBER OF PEOPLE DYING FROM FIRES AND THE AMOUNT OF DOLLARS LOST IN PROPERTY DAMAGE WILL BEGIN TO INCREASE AGAIN. THEREFORE, I ASK YOU ON BEHALF OF THE FIRE SERVICES OF MARYLAND AND THE CITIZENS OF THIS GREAT STATE, WHOM WE HAVE TAKEN

THE RESPONSIBILITY TO PROTECT, THAT FULL CONSIDERATION AND A FAVORABLE RECOMMENDATION BE GIVEN BY THIS COMMITTEE FOR CONTINUED FEDERAL GENERAL REVENUE SHARING AT THE LEVEL THAT WILL PROVIDE CONTINUED RESOURCES TO STATE AND LOCAL GOVERNMENTS FOR FIRE SAFETY, FIRE PREVENTION AND FIRE SUPPRESSION. THANK YOU.

FIRE
IN
MARYLAND

1985

MARYLAND STATE FIRE MARSHAL

STATISTICAL DATA COMPILED FROM THE MARYLAND FIRE INCIDENT REPORTING SYSTEM

1985
ANNUAL REPORT

Written and Prepared by

ROBERT B. THOMAS, JR.
Deputy Chief State Fire Marshal

SHIRLEY FENNELL-KELSO
Administrative Aide

SALLY JOHNSON
Secretary
DARLENE MILLER
Secretary

For

ROCCO J. GABRIELE
Maryland State Fire Marshal

MARYLAND STATE FIRE MARSHAL'S OFFICE

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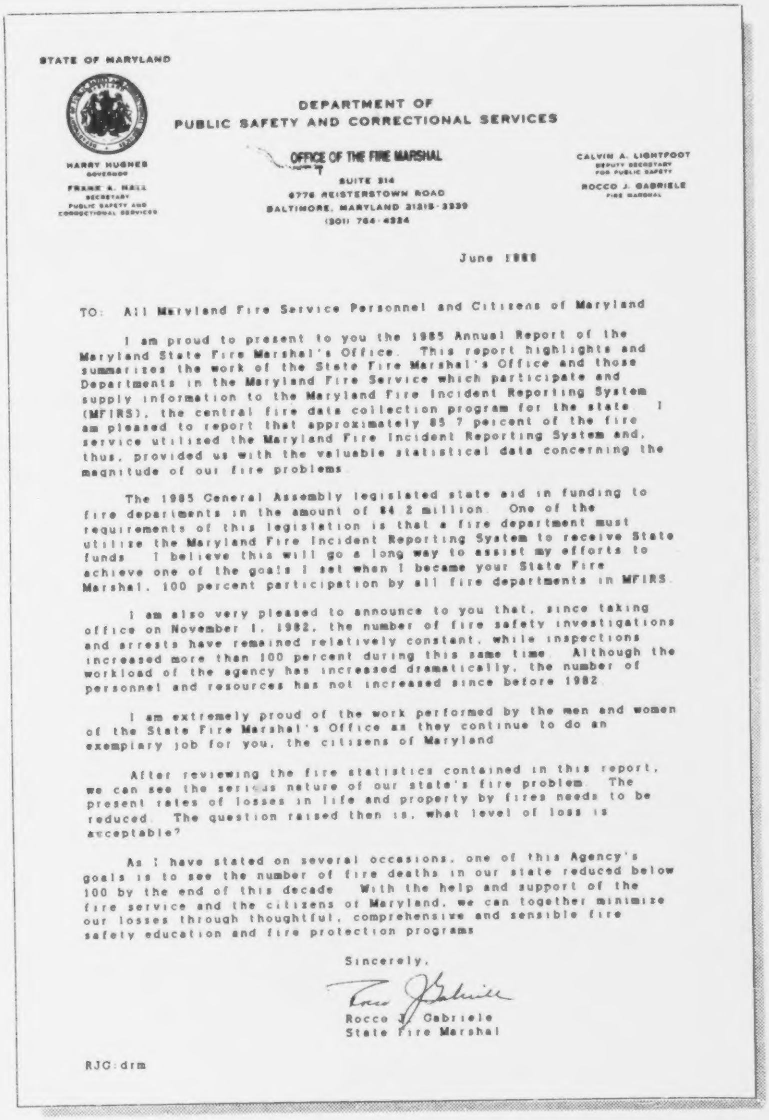
ROCCO J. GABRIELE
MARYLAND STATE FIRE MARSHAL



STATE OF MARYLAND

HARRY HUGHES
GOVERNOR

FRANK A. HALL
SECRETARY
PUBLIC SAFETY AND
CORRECTIONAL SERVICES

DEPARTMENT OF
PUBLIC SAFETY AND CORRECTIONAL SERVICES

OFFICE OF THE FIRE MARSHAL
SUITE 314
6776 REISTERSTOWN ROAD
BALTIMORE, MARYLAND 21215-2339
(301) 764-4324

CALVIN A. LIGHTFOOT
DEPUTY SECRETARY
FOR PUBLIC SAFETY

ROCCO J. GABRIELE
FIRE MARSHAL

June 1986

TO: All Maryland Fire Service Personnel and Citizens of Maryland

I am proud to present to you the 1985 Annual Report of the Maryland State Fire Marshal's Office. This report highlights and summarizes the work of the State Fire Marshal's Office and those Departments in the Maryland Fire Service which participate and supply information to the Maryland Fire Incident Reporting System (MFIRS), the central fire data collection program for the state. I am pleased to report that approximately 85.7 percent of the fire service utilized the Maryland Fire Incident Reporting System and, thus, provided us with the valuable statistical data concerning the magnitude of our fire problems.

The 1985 General Assembly legislated state aid in funding to fire departments in the amount of $4.2 million. One of the requirements of this legislation is that a fire department must utilize the Maryland Fire Incident Reporting System to receive State funds. I believe this will go a long way to assist my efforts to achieve one of the goals I set when I became your State Fire Marshal, 100 percent participation by all fire departments in MFIRS.

I am also very pleased to announce to you that, since taking office on November 1, 1982, the number of fire safety investigations and arrests have remained relatively constant, while inspections increased more than 100 percent during this same time. Although the workload of the agency has increased dramatically, the number of personnel and resources has not increased since before 1982.

I am extremely proud of the work performed by the men and women of the State Fire Marshal's Office as they continue to do an exemplary job for you, the citizens of Maryland.

After reviewing the fire statistics contained in this report, we can see the serious nature of our state's fire problem. The present rates of losses in life and property by fires needs to be reduced. The question raised then is, what level of loss is acceptable?

As I have stated on several occasions, one of this Agency's goals is to see the number of fire deaths in our state reduced below 100 by the end of this decade. With the help and support of the fire service and the citizens of Maryland, we can together minimize our losses through thoughtful, comprehensive and sensible fire safety education and fire protection programs.

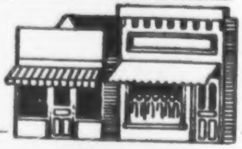
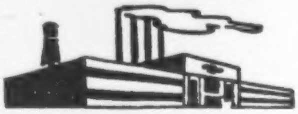
Sincerely,

Rocco J. Gabriele

Rocco J. Gabriele
State Fire Marshal

RJG:drm

FIRES BY MAJOR CLASSIFICATION
MARYLAND FIRE INCIDENT REPORTING SYSTEM

NUMBER OF FIRES			
1985	1984		
10,924	8,037		**RESIDENTIAL**
679	654		**MERCANTILE**
281	163		**INDUSTRIAL**
281	114		**SCHOOLS**
427	360		**PUBLIC ASSEMBLY**
6,037	5,761		**VEHICLE**
7,851	5,027		**TREE & BRUSH**

REPORT OVERVIEW

The Maryland Fire Incident Reporting System (MFIRS) is the central data coordinating and collection agency for the fire service in the state. Incident reports from nearly 300 career and volunteer fire departments throughout the state provide essential information about the causes and effects of fire, the nature of any equipment involved in these fires, the burn injury and fire death problems, as well as other elements of overall fire service activities.

For many years, fire departments nationally have recognized the importance and useful purposes which data serves. In 1985, after nearly nine years of tireless and dedicated efforts, 85.7 percent of Maryland fire service participated in the MFIRS program. Those counties which had 100 percent participation in the Maryland Fire Incident Reporting System during 1985 were: Allegany, Anne Arundel, Baltimore City, BWI Airport, City of Annapolis, Calvert, Caroline, Cecil, Frederick, Garrett, Harford, Howard, Kent, Montgomery, Prince George's, Queen Anne's, St. Mary's, Talbot, Washington and Wicomico.

On the state and local level, the data gathered from the fire incident reports can be used to identify problems areas, determine fire trends, supply information necessary for appropriate legislative actions and formulate improvements for the fire service in general.

After reviewing the 1985 data obtained from the Maryland Fire Incident Reporting System, some of the highlights that were noted included:

-- Fire departments responded to 154,725 incidents in the State of Maryland.

-- There were 10,924 reported residential fires.

-- There were approximately 2,955 residential fires where no smoke detector was found.

-- 127 people died as a result of fires, including one firefighter who lost his life in the line of duty.

-- 411 civilians and 389 firefighters were injured as the result of fires.

-- Cooking related fires in the kitchen/cooking area was the leading cause of residential fires accounting for 20.0% of all residential fires.

-- Kerosene heaters resulted in 189 fire incidents.

REPORT OVERVIEW *(continued)*

- Chimney and wood stove fire incidents continued to be a major fire problem in the state amounting to approximately 2,082 fire incidents.

- False alarm incidents increased by 9.2 percent in 1985 over 1984 totals.

- Approximately $89,428,411 in property was destroyed or damaged by fire throughout the State of Maryland.

There is no single, simple solution to our state's fire problem. However, by using information discussed in this report, fire chiefs, administrators, fire prevention officers, researchers and governmental officials, as well as others concerned about our state's fire problems, can move forward together to reduce these tragedies from fires.

CHAPTER 1

> *"Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it."*
>
> SAMUEL JOHNSON

A SYNOPSIS OF THE DUTIES AND RESPONSIBILITIES OF THE MARYLAND STATE FIRE MARSHAL'S OFFICE

The Office of the State Fire Marshal was officially created as it exists today in 1964, but has functioned in one manner or another since 1890. The responsibilities, powers and duties of the State Fire Marshal are multi-faceted. The responsibilities include, but are not limited to, the establishment and enforcement of fire safety practices throughout the state, preventive inspection and correction activities, review of new construction projects, coordination of fire safety programs with career and volunteer fire departments, and develop critical analysis and evaluation of Maryland fire loss statistics for determination of problems and solutions.

The duties include the enforcement of all laws of the state having to do with: prevention of fire, storage sale and use of any explosive; the installation and maintenance of equipment intended for fire control, detection and extinguishment; building construction and adequacy of exits; and, the suppression of arson.

To accomplish the mandated duties of fire investigation, fire prevention inspections, explosive licensing and regulation, and public fire safety education, the State Fire Marshal's Office is manned by a staff of 46 people. Of this number, 32 conduct inspections and investigations, 4 are fire protection engineers which conduct plan reviews and assist field personnel with technical advice on matters of fire protection; 1 fire safety education specialist, and 10 clerical staff individuals.

Over the past several years, the role of the State Fire Marshal's Office has changed from a reactive to a proactive role. Consequently, the agency has increased the number of quality fire safety inspections from 3,450 in 1982 to approximately 14,560 in 1985. Also, requests for fire investigations has remained constant over the past three (3) years at 1,436 in 1983, 1,372 in 1984 and 1,328 in 1985, respectively.

The agency also maintains the only Bomb Squad and Hazardous Materials Response Team on the state level in the public safety arena. The squad of ten (10) personnel utilize six (6) special equipped vans to address requests for situations where explosive devices are utilized or explosive substances require their services. These calls for service are steadily increasing, particularly in the area of hazardous materials.

As a result of proper utilization of manpower, establishment of strict priorities and the adoption of sound law enforcement techniques, the State Fire Marshal's Office is continuing to make an impact on the fire problems in the State of Maryland.

STATE FIRE MARSHAL'S OFFICE
STATISTICS

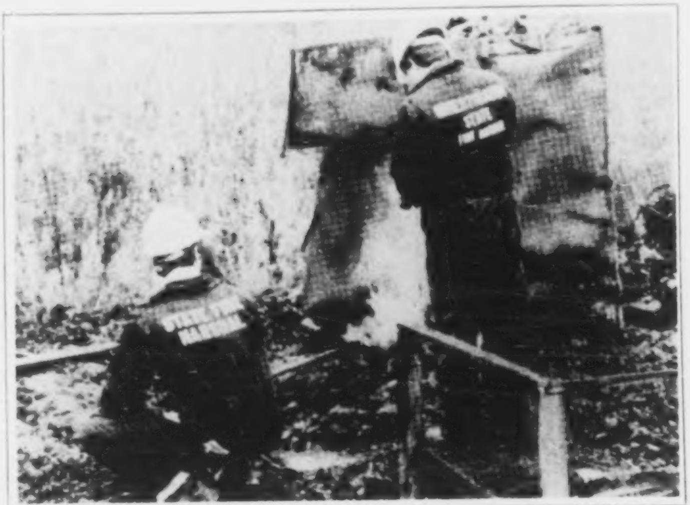
The State Fire Prevention Commission and Fire Marshal operate in conformity with Sections 1 through 36 and 47 through 55 of Article 38A of the Annotated Code of Maryland. The State Fire Marshal is charged with the responsibility of safeguarding life and property from the hazards of fire and explosion. The State Fire Marshal's Office inspects a wide range of buildings and occupancies to ensure compliance with statutes and regulations relating to fire and life safety. The agency also investigates fires and explosions, and arrests those individuals who violate the fire laws of the State of Maryland.

The statistics below indicate a broad spectrum of the work conducted by the State Fire Marshal's Office during Calendar Year 1984. During CY 1984, more fire safety inspections were conducted than ever before. The 14,560 inspections which were conducted represented an increase of 52 percent over the 1984 figure of 9,589.

	1984	1985
Fire Prevention Inspections and Re-inspections	9,589	14,560
Review of Construction Plans and Specifications	2,326	2,571
License Approvals for Manufacturers, Dealers and Users of Explosives	594	349
Permits for Displays of Fireworks	135	145
Deactivation/Removal of Explosives and Hazardous Materials	239	267
Fire Investigations	1,270	1,328
Fires Determined As Arson	498	511
Number of Arson Cases Closed by Arrest	228	126
Receipts from Licenses Issued	$27,670	$29,950

FIRE INVESTIGATION AND INSPECTIONS

(Statistics For Calendar Year 1985)



STATE FIRE MARSHAL'S OFFICE	
Total Fire Investigations	- 1.328
Accidental	- 692
Incendiary	- 511
Undetermined	- 99
Closed by Arrest	- 126
Total Inspections	- 14.560

EASTERN REGION	
Total Fire Investigations	- 222
Accidental	- 108
Incendiary	- 85
Undetermined	- 28
Closed by Arrest	- 21
Total Inspections	- 1,861

CENTRAL REGION	
Total Fire Investigations	- 366
Accidental	- 198
Incendiary	- 146
Undetermined	- 21
Closed by Arrest	- 39
Total Inspections	- 3,458

NORTHEAST REGION	
Total Fire Investigations	- 373
Accidental	- 181
Incendiary	- 161
Undetermined	- 21
Closed by Arrest	- 35
Total Inspections	- 3.290

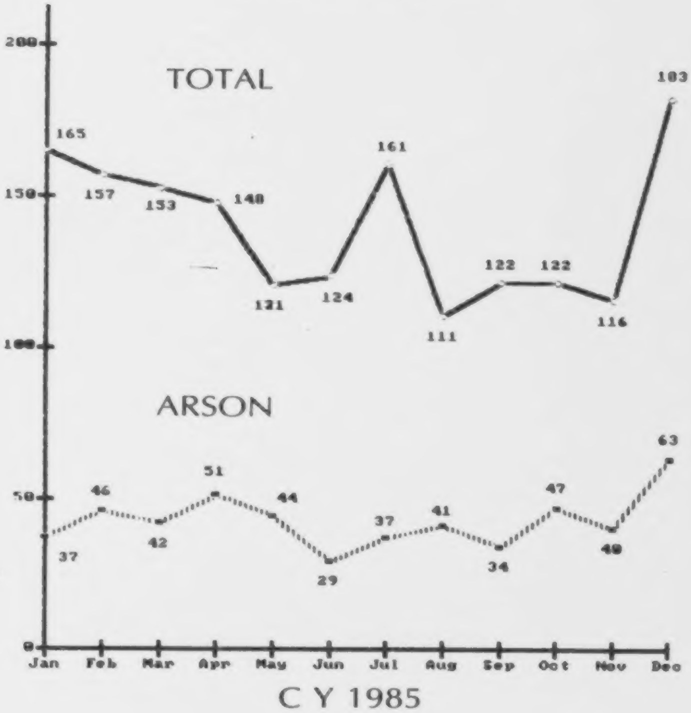
SOUTHERN REGION	
Total Fire Investigations	- 201
Accidental	- 117
Incendiary	- 64
Undetermined	- 11
Closed by Arrest	- 23
Total Inspections	- 2.077

WESTERN REGION	
Total Fire Investigations	- 166
Accidental	- 88
Incendiary	- 55
Undetermined	- 18
Closed by Arrest	- 8
Total Inspections	- 3,231

STATE FIRE MARSHAL'S OFFICE
FIRE INVESTIGATIONS
1985

The graph below shows a month-by-month comparison of the total number of fires investigated as well as those fires determined to be arson. During 1985, 1,328 fires were investigated by the State Fire Marshal's Office throughout the State of Maryland. Of the 1,328 fires investigated, 511 were arson.

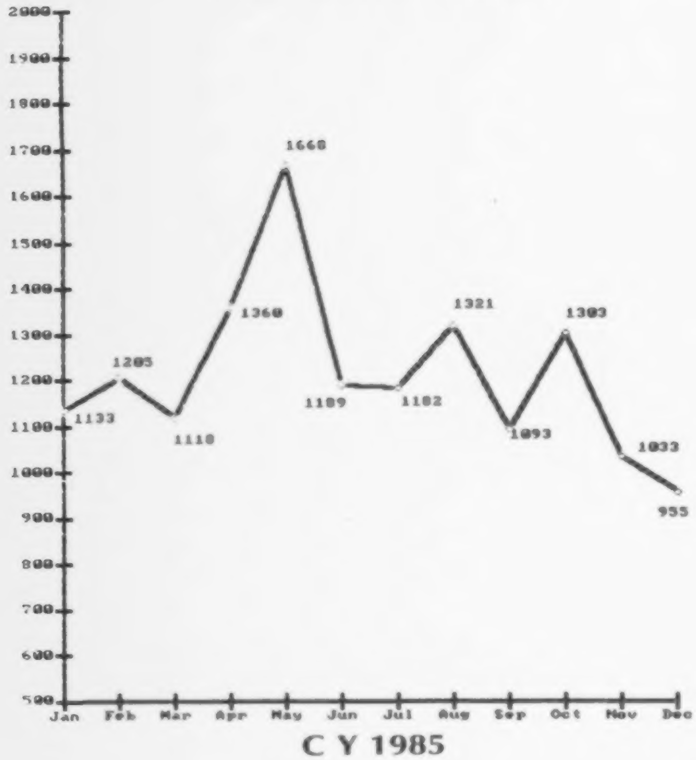
INVESTIGATIONS



STATE FIRE MARSHAL'S OFFICE
TOTAL INSPECTIONS
1985

The graph below indicates a month-by-month analysis of the total fire prevention inspections conducted during 1985 by members of the State Fire Marshal's Office. In 1985, 14,560 inspections were conducted by the State Fire Marshal's Office; the most ever recorded in the history of the agency.

INSPECTION TOTALS



BOMB SQUAD STATISTICS

The State Fire Marshal has the responsibility to enforce the laws and regulations regarding the sale, manufacture, possession and inspection of sites where explosives are used.

To help perform these responsibilities, the State Fire Marshal operates a ten (10) member expert bomb squad. The bomb squad responds in the case of some types of bomb threats or in the event of a suspected explosive device is found. Bomb squad personnel dispose of old or discarded commercial explosives, fireworks and military ordnance.

In addition to the explosives assistance the State Fire Marshal provides throughout the state, the office also has the responsibility to assist those state agencies and fire departments that respond to situations involving the leak or spill of any hazardous chemicals or materials.

	Detonated Ignition		Non-Detonated Non-Ignition	
	1984	1985	1984	1985
BOMB INCIDENTS				
A. Explosive	23	22	17	15
B Incendiary	1	4	0	0
EXPLOSIVES				
A. Recovered Explosives	0	1	26	19
B. Military Ordnance	1	1	19	47
C. Pyrotechnics (Fireworks)	6	15	29	65
CHEMICALS				
A Hazardous Chemicals	2	1	59	35
B Hazardous Materials	0	0	2	13
HOAXES				
A. Hoaxes (Fake Bombs)	0	0	3	7
B Suspicious Packages	0	0	38	13
C. Bomb Threats	0	0	13	9
RAD				
A. Radioactive Materials	0	0	0	0
TOTALS	33	44	206	223

FIRE INVESTIGATION STATISTICS FOR AFFILIATED JURISDICTIONS

FISCAL YEAR 1985

ANNE ARUNDEL COUNTY
- Total Fire Investigations - 322
  - Accidental - 113
  - Undetermined - 109
  - Incendiary - 100

BALTIMORE CITY
- Total Fire Investigations - 1,558
  - Accidental - 702
  - Undetermined - 218
  - Incendiary - 638

BALTIMORE COUNTY
- Total Fire Investigations - 427
  - Accidental - 126
  - Undetermined - 29
  - Incendiary - 272

MONTGOMERY COUNTY
- Total Fire Investigations - 572
  - Accidental - 177
  - Undetermined - 5
  - Incendiary - 390

OCEAN CITY
- Total Fire Investigations - 183
  - Accidental - 173
  - Undetermined - 6
  - Incendiary - 4

PRINCE GEORGE'S COUNTY
- Total Fire Investigations - 560
  - Accidental - 225
  - Undetermined - 58
  - Incendiary - 277

WICOMICO COUNTY
- Total Fire Investigations - 116
  - Accidental - 77
  - Undetermined - 17
  - Incendiary - 22

WORCESTER COUNTY
- Total Fire Investigations - 68
  - Accidental - 34
  - Undetermined - 20
  - Incendiary - 14

STATE-WIDE TOTALS
- Total Fire Investigations - 3,806
  - Accidental - 1,627
  - Undetermined - 462
  - Incendiary - 1,717

STATE FIRE MARSHAL'S OFFICE
PERSONNEL AND OFFICES

BALTIMORE OFFICE

Headquarters
6776 Reisterstown Road, Suite 314
Baltimore, Maryland 21215-2339
PHONE: 301-764-4324

Rocco J. Gabriele - Fire Marshal
John H. Farrell - Chief Deputy Fire Marshal
John F. Bender - Chief Fire Protection Engineer
Robert B. Thomas, Jr. - Deputy Chief Fire Marshal
Shirley M. Fennell-Kelso - Administrative Aide, MFIRS Coordinator
Sally J. Johnson - Secretary
Kathy A. Reilly - Secretary
Rosalyn L. Loney - Secretary
Darlene R. Miller - Secretary

NORTHEAST REGIONAL OFFICES — Harford, Cecil and Kent Counties

Elkton Office
170 East Main Street
Elkton, MD 21921
PHONE: 301-392-4254 Ext. 350

Bel Air Office
Dist. Court/Multi-Service Ctr.
2 South Bond Street
Bel Air, MD 21014
PHONE: 301-836-4844

Allen L. Ward - Deputy Chief State Fire Marshal
Harford, Cecil & Kent Counties

DFM = Deputy Fire Marshal

DFM Michael D. Bond	Harford
DFM Samuel R. Powell	Kent
DFM Joseph G. Zurolo, Jr.	Cecil
DFM Thomas A. Sharpless	Cecil
DFM W. Faron Taylor	Harford
DFM C. Mark VanBaalen	Harford
SEC M. Elizabeth Weiderhold	

CENTRAL REGIONAL OFFICES — Carroll, Frederick and Howard Counties

Ellicott City Office
District Court/Multi-Service Center
3451 Court House Drive
Ellicott City, MD 21043
PHONE: 301-455-8745

Frederick Office
137 W. Patrick Street
Frederick, MD 21701
PHONE: 301-694-2365

Charles M. Cronauer - Deputy Chief State Fire Marshal
Frederick & Howard Counties

DFM Ruxton R. Bramble	Howard
DFM John R. Earp, Jr.	Howard
DFM J. Ellwood Kauffman	Carroll
DFM Frank M. Rauschenberg	Carroll
DFM Jerry L. Chipley	Frederick
DFM Richard G. LaBrocco	State-Wide
DFM Harry T. Meminger, Jr.	Frederick
FPE A. Larry Iseminger, Jr.	Carroll, Frederick, Howard
SEC. Cynthia A. Amann	

SOUTHERN REGIONAL OFFICES — Calvert, Charles and St. Mary's Counties

Waldorf Office
Box 163, Sub-Station Road
Waldorf, MD 20601
PHONE: 301-645-4049

William A. Mitchell - Deputy Chief State Fire Marshal
Calvert, Charles & St. Mary's Counties

DFM Clyde A. Lawrence	St. Mary's
DFM Warren D. Gott	Calvert
DFM Maurice Cox	Charles
DFM Bobby Wedlcok	Charles
FPE Harry L. Bradley	Calvert, Charles & St. Mary's
SEC. Martha Boone	

WESTERN REGIONAL OFFICES — Allegany, Garrett and Washington Counties

Hagerstown Office
33 West Washington Street
Hagerstown, MD 21740
PHONE: 301-791-4758

Cumberland Office
(no mailing address)
PHONE: 301-777-9109

Robert H. Shimer - Deputy Chief State Fire Marshal
Allegany, Garrett & Washington Counties

DFM Ronald L. Moser	Washington
DFM James L. Kittel	Washington
DFM James A. Martin	Allegany
DFM Guy L. Carola	Garrett
DFM William D. Ramsey	State-Wide
FPE A. Larry Iseminger, Jr.	Allegany, Garrett & Washington
SEC. Heidi Ritchie	

EASTERN REGIONAL OFFICES — Caroline, Dorchester, Queen Anne's, Somerset, Talbot, Worcester and Wicomico Counties

Easton Office
Aurora Park Drive
Easton, MD 21601
PHONE: 301-822-7809

John H. Farrell - Chief Deputy Fire Marshal
All of the Above Counties

DFM Vernon V. Dulin	Talbot & Queen Anne's
DFM David C. Herring	Dorchester & Wicomico
DFM Carl C. Coventry	Caroline
DFM George C. Kinhart	Somerset & Worcester
FPE Kenneth E. Bush	All of the Above Counties
SEC. Donna Towers	

MARYLAND STATE FIRE PREVENTION COMMISSION

The State Fire Prevention Commission, which consists of nine (9) persons, has the power to promulgate, amend and repeal regulations for the safeguarding of life and property from the hazards of fire and explosion. The Commission meets bi-monthly throughout the year to hear appeal hearings regarding the State Fire Prevention Code as well as receive reports from the State Fire Marshal on general matters concerning the Office of the Fire Marshal and fire safety in the State of Maryland. The offices of the Commission are located at the Mary E. W. Risteau Multi-Service Center, 2 S. Bond Street, Bel Air, Maryland 21014, telephone no. 836-4844.

The current members of the State Fire Prevention Commission are:

C. Oscar Baker - Chairman
4049 Boteler Road
Mt. Airy, MD 21771

Merhl Remsberg - Vice-Chairman
3898 Jefferson Pike
Jefferson, MD 21755

Leslie B Thompson
R. 1, Box 177
Pear Tree Point
Chestertown, MD 21620

Jack T. Dorsey
501 W. Chesapeake Beach Rd.
Box 26
Owings, MD 20836

Earl W. Smith
1809 Alto Vista Avenue
Baltimore, MD 21207

Daniel B. Smith, Sr.
137 Edmund Street
Aberdeen, MD 21001

W. McNeil Baker
818 Ridgeleigh Road
Baltimore, MD 21212

Wayne D. Smith
835 Mulberry Avenue
Hagerstown, MD 21740

Michael C. Gibbons
10721 Tucker Street
Beltsville, MD 20705

M. Elizabeth Weiderhold
Secretary
2 South Bond Street
Bel Air, Maryland 21014

CHAPTER 2

"It is a capital mistake to theorize before one has data."

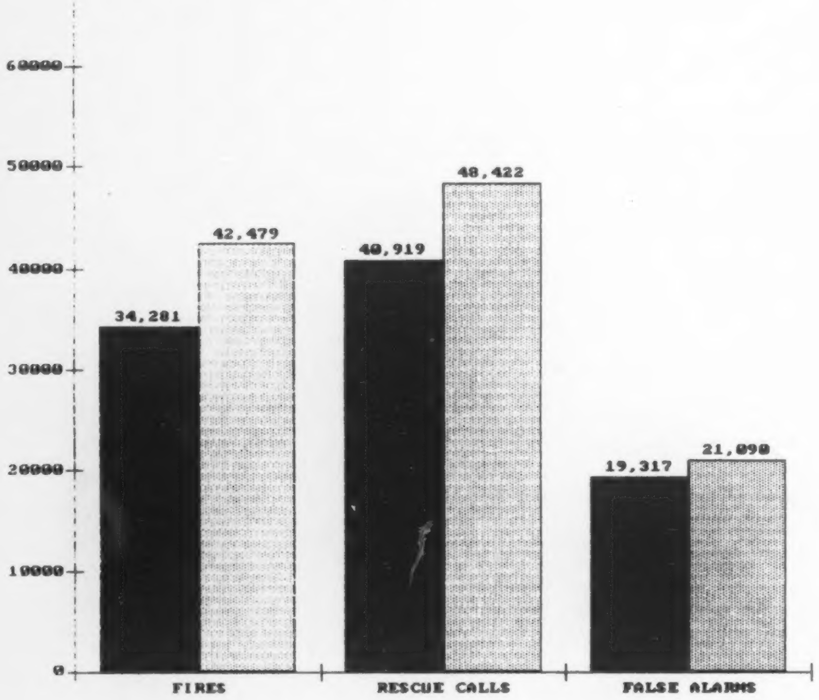
SIR ARTHUR CONAN DOYLE

MARYLAND STATE FIRE INCIDENT REPORTING SYSTEM
STATE-WIDE SELECTED STATISTICS FOR 01/01/85 - 12/31/86

	TOTAL		MUTUAL AID GIVEN		MUTUAL AID REC'D OR NO MUTUAL AID	
FIRES						
Building Fires	20,366		9,802		10,564	
Vehicle Fires	6,859		822		6,037	
Other Fires	15,254		2,719		12,535	
Total Fires		42,479		13,343		29,136
OVERPRESSURE RUPTURES		330		8		322
RESCUE CALLS						
Emergency Medical Treatment	41,253		2,114		39,139	
All Others	7,169		2,101		5,068	
Total Rescue Calls		48,422		4,215		44,207
HAZARDOUS CONDITION CALLS		13,354		1,402		11,952
SERVICE CALLS		9,495		2,898		6,597
GOOD INTENT CALLS		18,103		2,118		15,985
FALSE CALLS						
Malicious Calls	10,588		675		9,913	
Other False Calls	10,502		2,601		7,901	
Total False Calls		21,090		3,276		17,814
ALL OTHER CALLS		1,452		222		1,230
TOTAL CALLS		154,725		27,482		127,243
TOTAL INCIDENTS WITH EXPOSURE FIRES		27		2		25
Total Exposure Fires		32		2		30
NUMBER OF TIMES MUTUAL AID GIVEN		27,482				
NUMBER OF TIMES MUTUAL AID RECEIVED		21,177				
TOTAL FIRE DOLLAR LOSS		$89,308,997		$50,0000		$89,308,997
TOTAL NON-FIRE DOLLAR LOSS		$ 119,444				$ 119,444
CASUALTY SUMMARY						
CIVILIAN						
Fire Related Injuries		411				411
Non-Fire Injuries		14				14
Fire Related Deaths		125				125
Non-Fire Deaths		2				2
FIRE SERVICE						
Fire Related Injuries		381				381
Non-Fire Injuries		21				21
Fire Related Deaths		2				2
Non-Fire Deaths						

MARYLAND FIRE INCIDENT REPORTING SYSTEM
FIRE, RESCUE & FALSE ALARM INCIDENTS
1984 and 1985

A comparison of overall state-wide fire, rescue and false alarm incidents is shown in the graph below for 1984 and 1985. Fires increased by 23.9 percent in 1985 over the 1984 figures, while rescue and false alarm incidents increased by 18.3 percent and 9.1 percent, respectively, over 1984 totals. Total fire, rescue and false alarm incidents increased in 1985 by 17,474 calls, or 18.4 percent over 1984.



■ 1984 — TOTAL INCIDENTS = 131,866

□ 1985 - TOTAL INCIDENTS = 154,725

NON-FIRE EMERGENCY INCIDENTS

A variety of emergency incidents, in addition to fires, continued to increase during 1985. These included calls for overpressure ruptures, rescues, hazardous conditions, service calls, good intent calls and others. Rescue calls accounted for 53.1 percent of the total non-fire emergency incidents in Maryland in 1985.

OVERALL STATE-WIDE EMERGENCY INCIDENTS OTHER THAN FIRE

Type of Incident	1984	1985
Overpressure Rupture	197	330
Rescue Calls	40,919	48,422
Hazardous Condition Calls	11,832	13,354
Service Calls	7,569	9,495
Good Intent Calls	16,497	18,103
All Other Calls	1,254	1,452
Total Emergency Incidents	78,268	91,156

Source: Maryland Fire Incident Reporting System
Office of the State Fire Marshal

STATE-WIDE
FALSE ALARM INCIDENTS

During 1985, there was a total of 21,090 reported false alarm incidents in Maryland. This indicates an increase of 2,132 false alarms over 1983 figures and 1,773 more false calls than in 1984. Of the 21,090 false alarm incidents, 10,588 or 50.2 percent of all false alarms were malicious in nature.

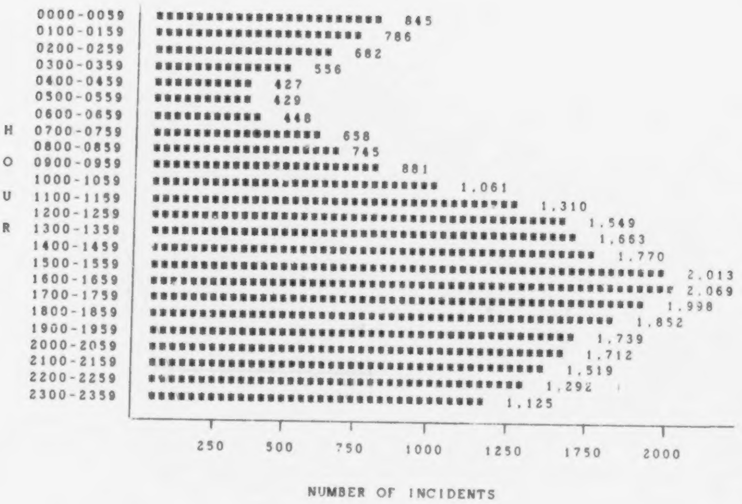
FALSE ALARMS 1985

MARYLAND FIRE INCIDENT REPORTING SYSTEM

FIRE DEPARTMENTS IN REPORTING SYSTEM	
Malicious Calls	10,588
Other False Calls	10,502
Total False Calls	21,090

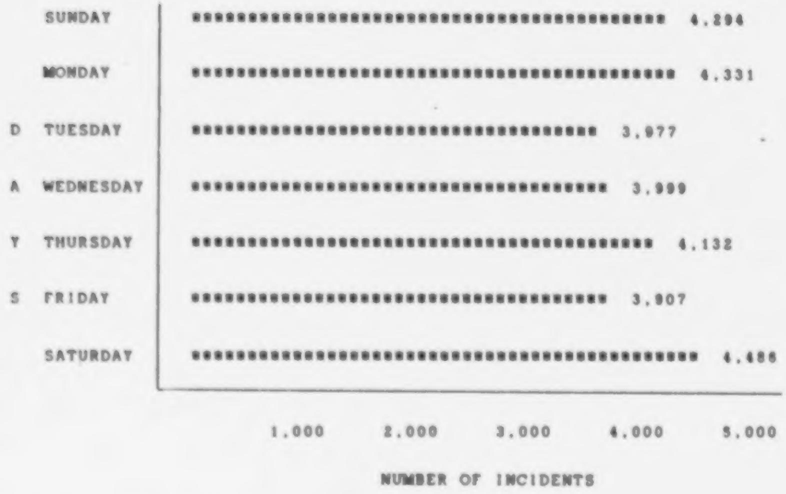
Source: Maryland Fire Incident Reporting System
Office of the State Fire Marshal

DISTRIBUTION OF TOTAL FIRE INCIDENTS BY HOUR 1985



The graph above represents a breakdown of total fire incidents by hour of the day based on a 24-hour clock. The most number of fire incidents occurred between 1600-1659 hours (4:00-4:59 p.m.), while the lowest number of incidents occurred between 0400-0459 (4:00-4:59 a.m.)

DISTRIBUTION OF TOTAL FIRE INCIDENTS BY DAY OF WEEK 1985



Source: Maryland Fire Incident Reporting System

The graph above shows the total fire department responses to fire incidents by day of the week. Fire incidents appeared to be evenly distributed throughout the week, although Saturday revealed the highest number of incidents at 4,486.

CHAPTER 3

> *"Out of the air, a voice without a face proved by statistics that some cause was just."*
>
> **W. H. AUDEN**

FIRE CAUSE FACTORS

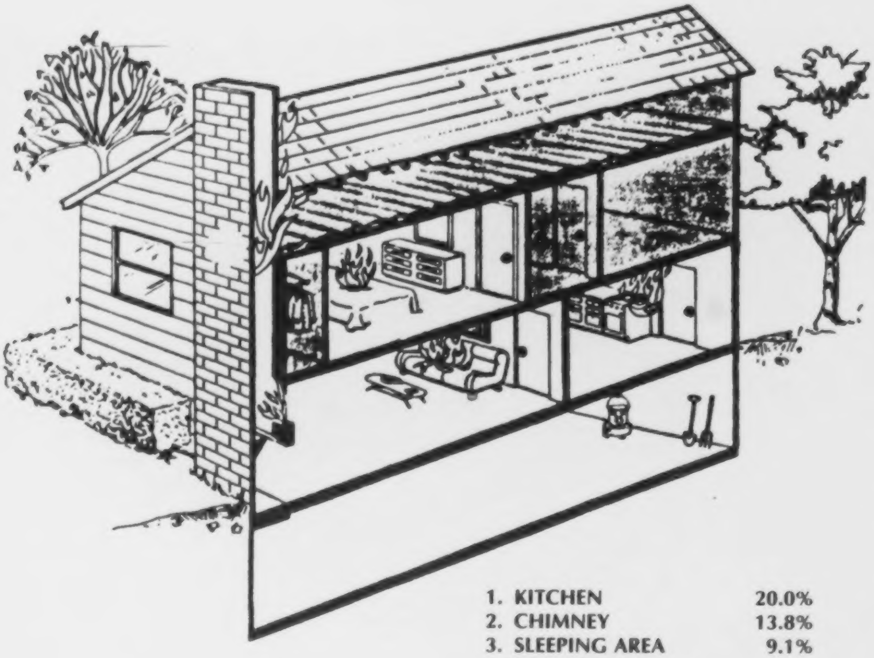
One of the benefits of the Maryland Fire Incident Reporting System (MFIRS) has been the increasing ability to help identify and analyze causal factors which lead to fires. The 1985 statistics obtained from MFIRS indicates that cooking fires in the kitchen were the leading cause of one and two family dwelling fire incidents, accounting for approximately 20.0 percent of these fires.

Kitchen/cooking fires were also found to be the leading area of origin of apartment fires. These fires accounted for 43.1 percent of all fire incidents in multi-family residential buildings. The predominant ignition factor in kitchen/cooking fires was listed as "unknown" at 33.1 percent of all calls.

The leading area of origin of school fires were trash containers at 34.6 percent of all incidents, while the leading ignition factor of school fires was once again reported as "unknown" at 32.4 percent of all such incidents.

Finally, field fires represented the highest number of outdoor fires, accounting for approximately 38.7 percent of these fire incidents. "Unknowns" were listed as the leading cause of outdoor property fires, accounting for 77.3 percent of all such fires, while matches were the cause in 7.5 percent of all such incidents.

WHERE FIRES OCCURRED IN RESIDENTIAL BUILDINGS 1985



1. KITCHEN	20.0%
2. CHIMNEY	13.8%
3. SLEEPING AREA	9.1%
4. LOUNGE AREA	7.9%

Statistics from MFIRS indicates that kitchens were, for the second consecutive year, the leading "Area of Origin" of fires which occurred in residential occupancies. Fires in the kitchen areas of residential buildings resulted in 20.0 percent of the fire problem in these structures. Chimneys, which were the leading area of origin in 1983, remained a significant problem area in 1985, as the second leading area of origin at 13.8 percent. The graph above indicates the four most frequently found areas of origin in all residential buildings during 1985.

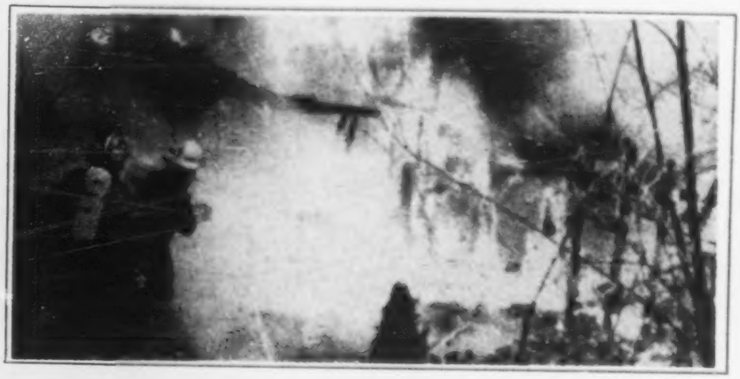
CHAPTER 4

"And I lie even among the children of men, that are set on fire."

PRAYER BOOK

ARSON IN MARYLAND

(A Statistical Summary)



During the past several years, much more attention has been brought upon both our state and national arson problem. For decades, very little information was gathered on a state-wide basis regarding this most destructive crime. Arson was perceived by many as solely an urban problem, restricted to inner city neighborhoods. However, today, we have come to the realization that arson is a problem that affects us from the mountains of Western Maryland to our lower Eastern Shore and permeates all geographic areas in Maryland.

As we learn more about arson, we continue to develop innovative programs to help combat this problem. Examples of such innovative programs are the arson task forces which operate in several local jurisdictions; OPERATION EXTINGUISH and Firehawks juvenile fire setters counseling programs in Montgomery and Prince George's Counties, respectively, as well as the juvenile fire setters programs in Baltimore City and Washington County. These programs and special projects are but a few of the many efforts being made by fire, police and community civic organizations in a continual attempt to reduce our state's fire and, particularly, arson problems.

In preparing this section, data collected by the Maryland Uniform Crime Reporting Program was used. The statistical data compiled by the Maryland Uniform Crime Reporting Program is based on information gathered from law enforcement agencies throughout the State of Maryland.

ARSON IN MARYLAND *(continued)*

Based on the data collected, arson offenses rose approximately 10 percent during 1985, as compared with 1984. During 1985, 2,960 arsons were reported as compared with 2,696 during 1984.

The Eastern Shore Region of the state, which includes the counties of Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester, experienced the most significant rise in reported arson cases during 1985 at 35 percent. The largest increase in arson in this region occurred in Dorchester County, where 24 reported arson cases occurred in 1985 as compared with just 8 such cases in 1984. The largest decline in arson on the Eastern Shore occurred in Talbot County, where arson dropped from 15 cases in 1984 to 8 such incidents in 1985.

The Washington Metropolitan Region of Montgomery and Prince George's Counties had the second highest increase in arson offenses, with a 17 percent increase in 1985 totals over 1984. Montgomery County records indicated the highest increase in this region with 511 reported cases in 1984 to 634 such incidents in 1985. Prince George's County had an increase of only 4 arson cases, tallying 248 in 1985 as compared with 244 in 1984.

The Western Maryland Region, which includes Allegany, Garrett, Washington, Frederick and Carroll Counties, experienced an increase of only 6 percent during 1985.

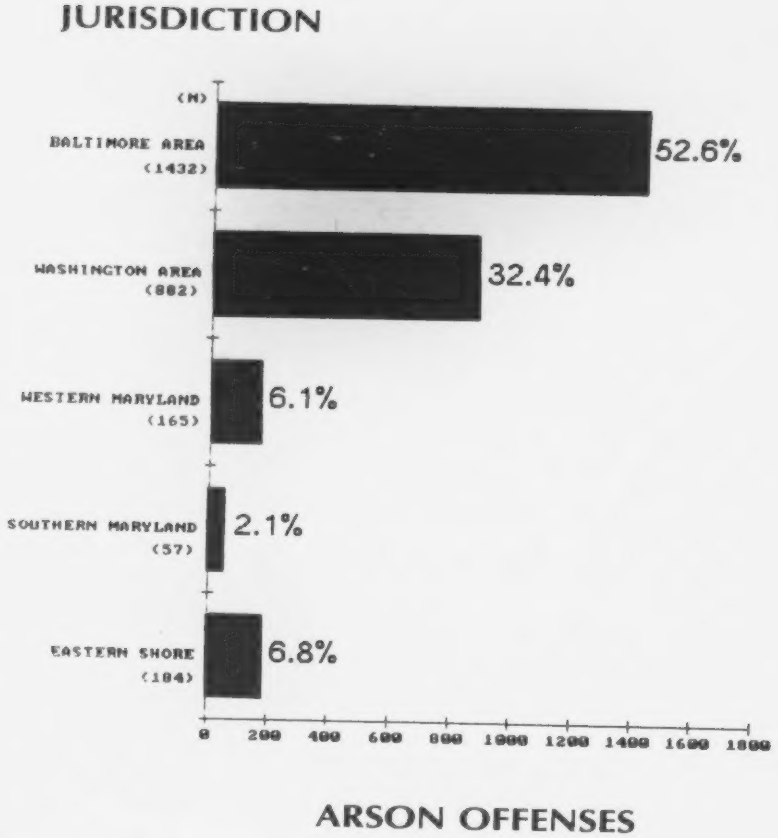
The Baltimore Metropolitan Region of Baltimore City, Anne Arundel, Baltimore, Harford and Howard Counties developed a 3 percent increase in reported arson offenses. The Baltimore Metropolitan Region revealed a slight increase from 1,391 arsons in 1984 to 1,432 in 1985.

Although the Baltimore Metropolitan Region indicated only a 3 percent increase in arson, Baltimore City had an approximate 14 percent increase in arson during 1985. There were 664 arsons reported in Baltimore City during 1985, as compared with 580 such incidents in 1984.

The sharpest decline in arson occurred in Southern Maryland in the counties of Calvert, Charles and St. Mary's. This region of the state experienced a 24 percent reduction in arson, falling from 75 reported cases in 1984 to 57 such incidents in 1985.

1985 ARSON DATA

C Y 1985



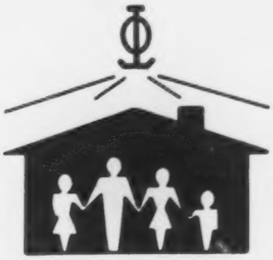
CHAPTER 5

"Change is inevitable. In a progressive country change is constant."

BENJAMIN DISRAELI

RESIDENTIAL SPRINKLERS

"The Lifesavers"



During the past two years, Marylanders, particularly our fire service, have learned a great deal about the latest technology in fire protection and life safety. This latest technology is residential sprinklers - "The Lifesavers".

In cooperation with the Maryland State Firemen's Association, the Maryland Fire and Rescue Institute and other organizations, the State Fire Marshal's Office, beginning with Project Zero in June of 1984, has been promoting through various seminars and demonstrations the benefits of residential sprinkler systems. At this time, we are happy to report we have an active program throughout the State.

As a result of two years of effort, we are starting to see positive results in the way of systems being installed and others planned.

Presently, some 2,000 dwelling units have been or soon will be provided with residential sprinklers. For the most part, these installations are being made on a voluntary basis.

A synopsis of the installations, which have been made across the state, and the various types of occupancies are as follows:

-- University of Maryland - campuses at College Park, Baltimore County and Eastern Shore. It is now a standard requirement in all new dormitories and the renovation of dormitories to install complete residential sprinkler systems. Additionally, at least two (2) off-campus fraternity houses have been retrofitted with residential sprinkler systems.

-- Prince George's County - has implemented a local amendment to the County building code to require residential sprinkler protection in all new multi-family residential occupancies of wood frame or ordinary type construction.

-- Montgomery County - has established a local task force by executive order to develop regulations which will require the mandatory installation of residential sprinkler systems in all new multi-family construction. These regulations are to be developed and implemented within one year.

-- Harford and Carroll County - Both counties have organized a local task force to review the feasibility and determination of incentives and/or acceptable "trade-offs" for implementing a voluntary residential sprinkler program.

-- Ocean City - Has developed a local task force which is currently considering a mandatory requirement to retrofit all multi-family residential buildings with more than fifteen (15) guest rooms or apartments and which are wood frame or ordinary construction and are more than two (2) stories in height.

Additionally, several lodging or rooming houses, commonly referred to as "Country Inns" or "Bed and Breakfast Inns", are being provided with residential sprinklers when renovated, in part due to the higher cost associated with bringing these facilities into compliance with the fire code while attempting to preserve the historical features of the buildings.

These are but a few of the examples of the impact residential sprinklers are having. In several other local jurisdictions, code officials are recommending residential sprinklers, as an alternative, on a case-by-case basis where there is a water supply deficiency.

A key concept which must be kept in mind of our state's residential sprinkler program is that we should strive to promote the installation of a new generation of "quick-response" fire sprinkler systems as a cost-effective alternative to conventional fire protection methods designed to save lives and property from fire in residential occupancies.

These programs are really just a beginning and much more needs to be done to support these efforts and resolve some of the technical and political questions which have been raised. However, it is our belief that as public awareness and education develops towards this technology, and with the working partnerships of these various task forces at both the State and local level, these issues can and will be resolved and, thus, fire protection and fire safety greatly enhanced throughout our state.

CHAPTER 6

> *"Any man's death diminishes me,*
> *because I am involved in Mankind."*
>
> **JOHN DONNE**

CASUALTIES AND DEATHS

In 1985, 127 people died in Maryland as the result of fires, including 2 Baltimore City firefighters who died in the line of duty. A detailed analysis of the fire death victims, including age factor, sex, causes of death, locations of victims at their time of death and the cause factors of fires in which deaths occurred, is shown below.

LOCATIONS	
Home	84
Auto	4
Mobile Home	4
Outside	5
Garage	1
Barn	2
Mercantile	6
Apartment Bldg.	19
Truck	1
Vacant Bldg.	1

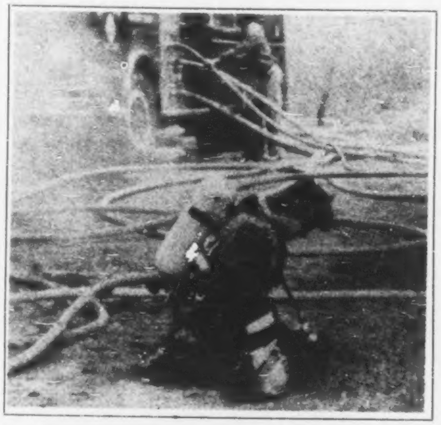
AGE OF VICTIMS	
0-6	25
7-15	11
16-24	8
25-33	12
34-42	10
43-51	10
52-60	13
61-69	11
70-78	13
79-87	10
88+	4

CAUSES OF DEATHS	
Burns	45
Asphyxiation	66
Other	16

SEX	
Male	80
Female	47

FIRE CAUSES IN WHICH DEATHS OCCURRED	
Explosion	7
Smoking	37
Other*	20
Heater/Furnace/Stove	10
Arson	4
Children with Matches	18
Flammable Liquids	4
Electrical	7
Suicide	7
Cooking Appliance	8
Wood Stove	5

* Includes Undetermined, Miscellaneous, Burning Trash

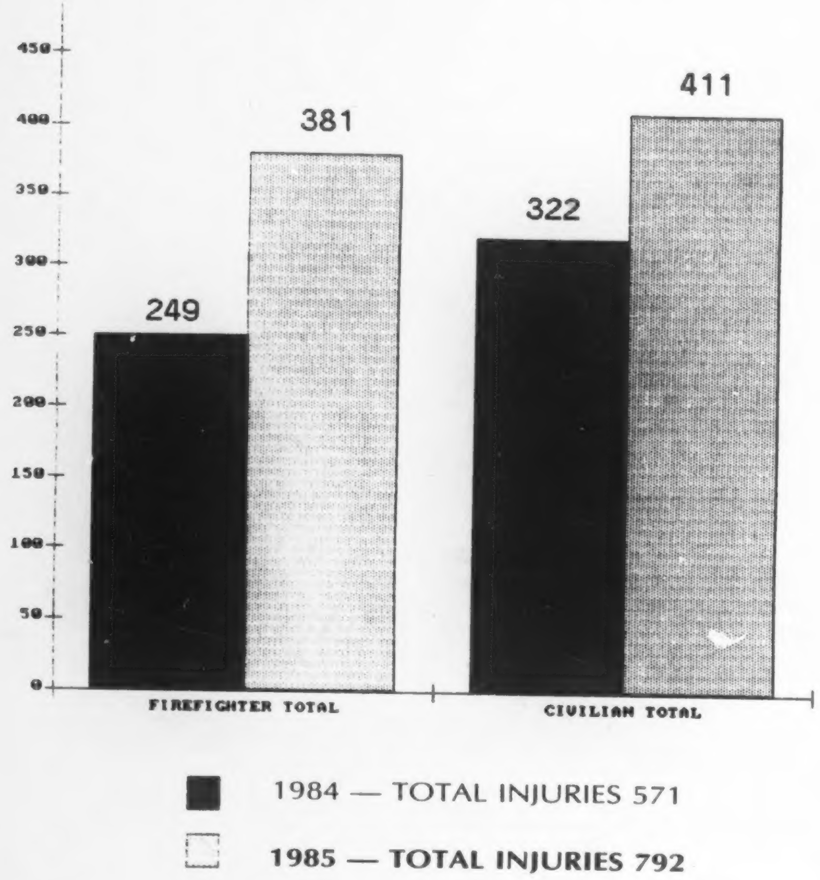


FIRE CASUALTIES BY COUNTY 1985

The data compiled by the Maryland Fire Incident Reporting System for 1985 indicates an increase in casualties in all counties throughout the state. It should be noted, that the relatively high number of injuries listed for Prince George's County is the result of a concerted effort on the part of the Prince George's County Fire Department to identify all types of injuries over the past several years, particularly fire related injuries. It is hoped that through research the identification of causal factors involved in fire injuries will ultimately result in a reduction of injuries within the state during the next decade.

	CIVILIAN		FIRE SERVICE	
	INJURY	DEATH	INJURY	DEATH
ALLEGANY COUNTY	22	4	24	0
ANNE ARUNDEL COUNTY	13	9	17	0
BALTIMORE CITY	208	43	184	2
BALTIMORE COUNTY	-	25	-	-
CALVERT COUNTY	12	4	12	0
CAROLINE COUNTY	1	0	1	0
CARROLL COUNTY	3	1	5	0
CECIL COUNTY	8	1	1	0
CHARLES COUNTY	10	5	1	0
DORCHESTER COUNTY	2	3	2	0
FREDERICK COUNTY	6	5	2	0
GARRETT COUNTY	2	2	1	0
HARFORD COUNTY	23	6	18	0
HOWARD COUNTY	12	1	9	0
KENT COUNTY	1	0	2	0
MONTGOMERY COUNTY	57	0	64	0
PRINCE GEORGE'S COUNTY	100	7	0	0
QUEEN ANNE'S COUNTY	3	0	1	0
ST. MARY'S COUNTY	6	0	16	0
SOMERSET COUNTY	4	3	2	0
TALBOT COUNTY	2	0	4	0
WASHINGTON COUNTY	23	1	14	0
WICOMICO COUNTY	4	7	3	0
WORCESTER COUNTY	4	0	9	0
CITY OF ANNAPOLIS	0	0	0	0

INJURIES
FIREFIGHTERS AND CIVILIANS



In Memoriam

In 1985, two Baltimore City Fire Department officers lost their lives as the result of firefighting and rescue activities.

LT. JOHN KILLIAN
OF ENGINE CO. 51

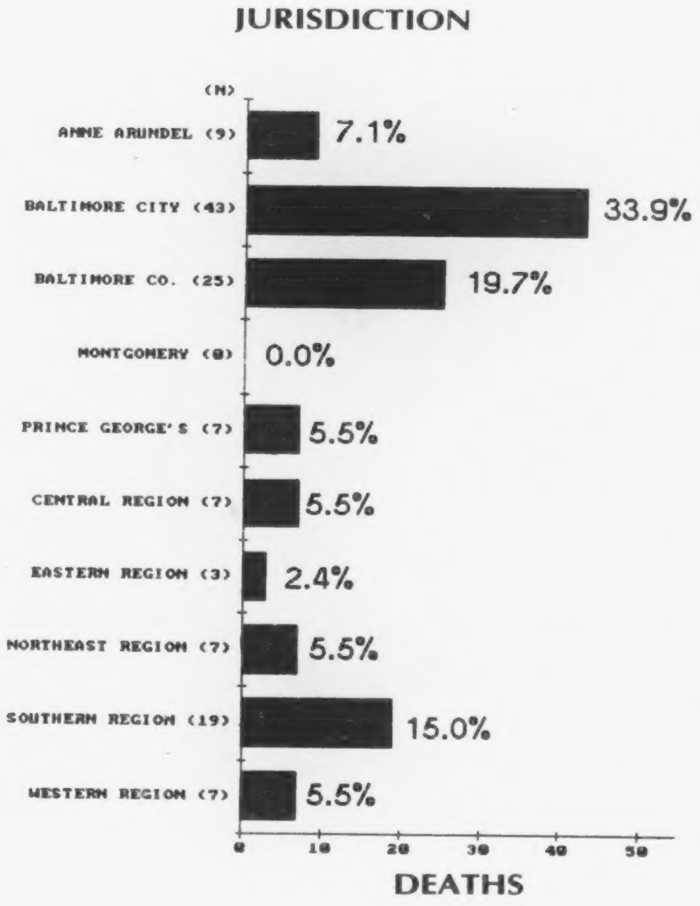
died in the line of duty on March 10, 1985 at a dwelling fire at 3203 Hudson Street in Baltimore.

LT. NELSON TAYLOR
OF ENGINE CO. 8

sustained critical injuries during suppression efforts on November 21, 1985 at a dwelling fire at 2668 Lauretta Avenue in Baltimore. Lt. Taylor died the following morning as a result of his injuries.

These two officers gave their lives in a valiant effort to protect and defend the citizens of their community and the State from fire.

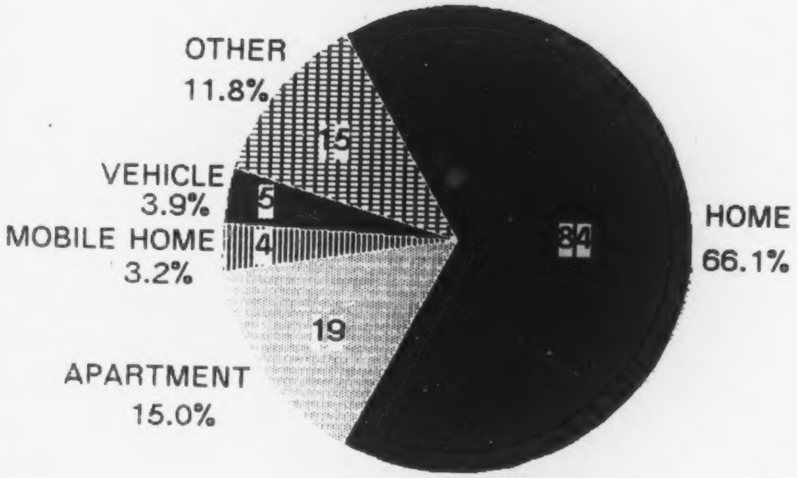
FIRE DEATHS BY JURISDICTION
1985



STATE OF MARYLAND

LOCATION WHERE FIRE DEATHS OCCURRED

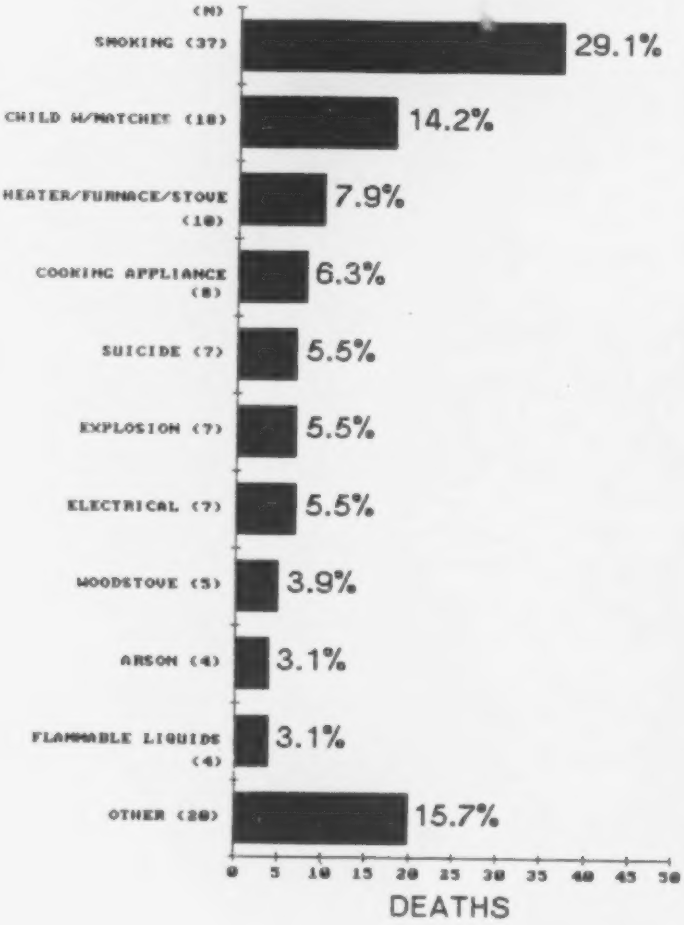
1985



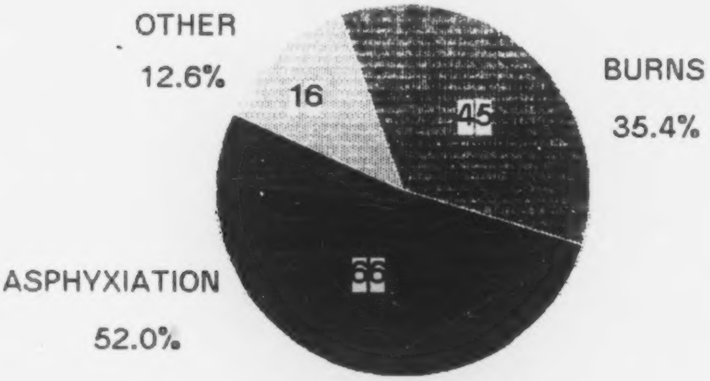
STATE OF MARYLAND

CAUSES OF FIRES WHERE DEATHS OCCURRED

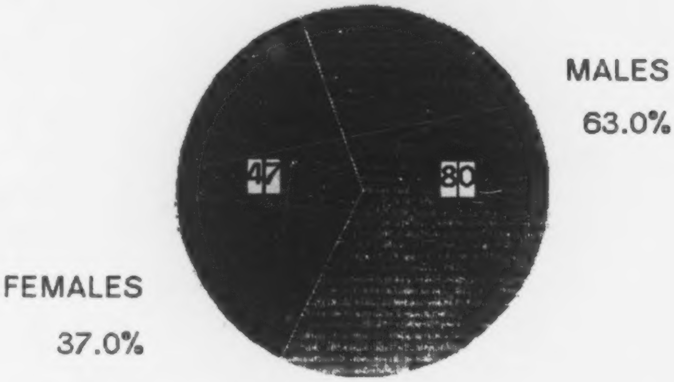
1985



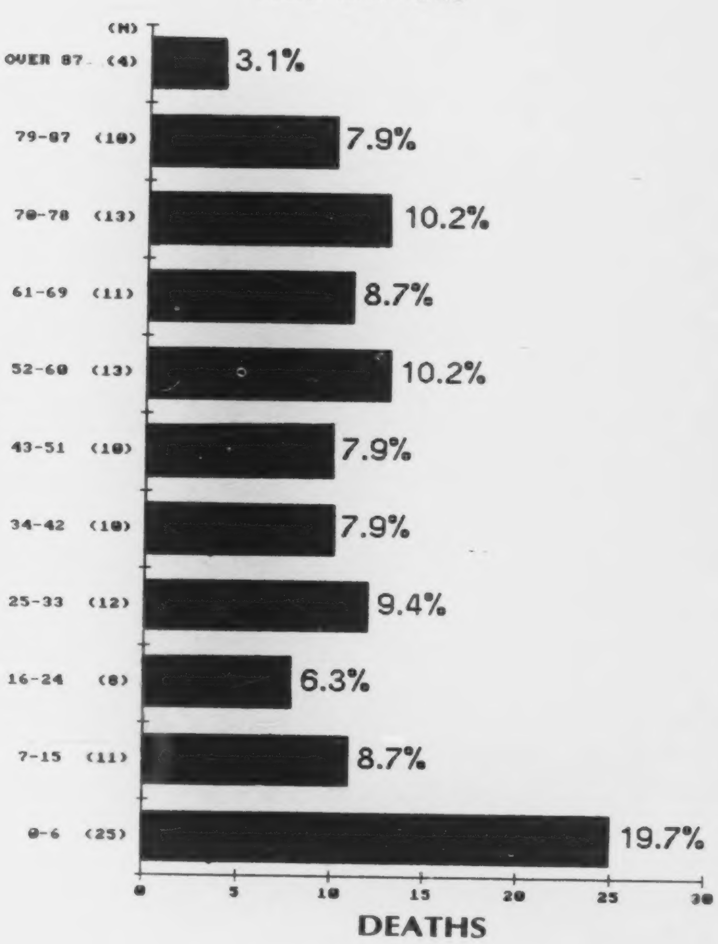
STATE OF MARYLAND
CAUSES OF FIRE DEATHS
1985



SEX OF DEATH VICTIMS



STATE OF MARYLAND
AGES OF FIRE VICTIMS



CHAPTER 7

"Whenever our neighbor's house is on fire, it cannot be amiss for the engines to play a little on our own."

EDMUND BLAKE

FIRE SUMMARY BY JURISDICTION

ALLEGANY COUNTY

Population: 80,230

Allegany County ranked 12th in total fire incidents In 1985, there were 446 structure fires, 149 vehicle fires and 164 outside fires, totalling approximately 759 fire incidents. Four civilians died in fires in 1985. Property damaged or destroyed by fire totalled $1,131,744.

There were 17 arson fires in the county during 1985, one more than in 1984.

ANNE ARUNDEL COUNTY

Population: 376,200

Anne Arundel County ranked 2nd in terms of total fire incidents. There were 6,032 structure fires, 1,165 vehicles fires and 3,417 outside fires, totalling 10,614 fire incidents. Nine people died in fires in the county during 1985. Property damaged or destroyed by fire totalled approximately $15,478,406.

There were 188 reported arson fires in the county during 1985, 25 less than the 213 reported in 1984.

BALTIMORE CITY

Population: 776,100

Baltimore City ranked 3rd in total fire incidents, with 4,165 structure fires, 1,625 vehicles fires and 3,709 outside fires reported in 1985. Forty-three people died in Baltimore during 1985 from fire, two of these fatalities were firefighters.

Additionally, fire destroyed more than $20 million in property in Baltimore City.

There were 664 reported arsons in the City in 1985, an increase of 14 percent over the 580 such incidents reported in 1984.

CALVERT COUNTY

Population: 36,950

Calvert County ranked 10th in terms of fire incidents in the state during 1985. There were 501 structure fires, 88 vehicle fires and 306 outside fires for a total of 895 fire incidents. Four people died in fires during the year, three

FIRE SUMMARY BY JURISDICTION *(continued)*

CALVERT COUNTY *(continued)*

of which died in a single fire during the Christmas holiday season.

Fire destroyed or damaged approximately $1,659,043 of property in Calvert County in 1985.

Arson offenses dropped from 22 incidents in 1984 to only 7 in 1985, one of the sharpest reductions in the state.

CAROLINE COUNTY

Population: 23,340

Caroline County ranked 15th overall in the state in fire incidents. There were 214 structure fires, 42 vehicle fires and approximately 105 outside fire incidents reported in 1985. The County also reported approximately $511,923 in property damaged by fire during the past year.

Caroline was one of only 7 jurisdictions where zero fire fatalities occurred.

The County also experienced a slight reduction in arson offenses in 1985 with 6 arsons reported in 1985 as compared with 8 in 1984.

CECIL COUNTY

Population: 61,200

Cecil County ranked 11th in the state in terms of fire incidents. There were 414 structure fires, 138 vehicle fires and 333 outside fires for a total of 885 reported fire incidents. Only 1 person died as a result of fire in 1985.

Additionally, approximately $4,505,508 in property was either destroyed or damaged in the County last year.

There was 58 reported cases of arson in the County in 1985, an increase from the 41 cases recorded in 1984.

CHARLES COUNTY

Population: 77,200

Charles County ranked 20th in the state in terms of fire incidents, with 135 structure fires, 25 vehicle fires and 51 outside fires for a total of approximately 211 fire incidents.

Property damaged or destroyed by fire in the County is estimated at $538,495.

Five civilians died in fires in the County during 1985.

Arson offenses declined during the past year from 34 in 1984 to 24 in 1985.

DORCHESTER COUNTY

Population: 30,400

Dorchester County ranked 21st in the state in fire incidents. There were 84 structure fires, 45 vehicle fires and 66 outside fires for a total of 195 fire incidents reported during 1985. Also, approximately $257,285 in property was either destroyed or damaged.

Fires claimed the lives of 3 civilians during the year.

Arson offenses rose drastically during 1985, from 8 in 1984 to 26 such incidents.

FREDERICK COUNTY

Population: 120,400

Frederick County ranked 5th in the state in reported fire incidents. There were 1,259 structure fires, 260 vehicle fires and 506 outside fires, for a total of 2,025 fire incidents. Estimates of property either destroyed or damaged in 1985 totalled $2,178,741.

Five people died in fires in the County during 1985.

Arson rose dramatically in the County during the past year with 51 reported incidents as opposed to 34 such incidents in 1984.

GARRETT COUNTY

Population: 27,380

Garrett County ranked 17th in reported fire incidents in Maryland last year. There were 184 structure fires, 44 vehicle fires and 62 outside fires, for a total of approximately 290 fire incidents. These fires resulted in an estimated $1,509,180 in property damage in the County.

Additionally, Garrett County suffered the loss of 2 civilians as the result of fires during 1985.

Arson offenses increased slightly in 1985, with 12 reported incidents as compared with 9 such incidents in 1984.

HARFORD COUNTY

Population: 146,570

Harford County ranked 6th in the state during 1985 in fire incidents. There were 973 structure fires, 246 vehicle fires and 492 outside fires, for a total of approximately 1,711 fire incidents. Property damaged or destroyed by fires amounted to $3,373,889.

FIRE SUMMARY BY JURISDICTION *(continued)*

HARFORD COUNTY (continued)

A total of 6 Harford Countians lost their lives in fires during the year.

Total reported incidents of arson were 72, which was down 2 incidents from the 74 cases recorded in 1984.

HOWARD COUNTY

Population: 124,890

Howard County ranked 8th in the state during 1985 in fire incidents. There were 562 structure fires, 298 vehicle fires and 502 outside fires, for a total of 1,352 fire incidents. The total of estimated property damaged or destroyed by fires in 1985 amounted to $2,347,254.

Only 1 citizen in the County died as the result of fire during the year.

Arson increased dramatically in 1985 over 1984, with 66 reported cases as compared with 45 incidents the previous year.

KENT COUNTY

Population: 16,930

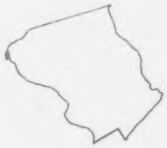
Kent County ranked 16th overall in the state last year in total fire incidents. There were 174 structure fires, 43 vehicle fires and 78 outside fires, for a total of 295 incidents. Approximately $855,898 in property was either destroyed or damaged by fires in the County.

Kent was also one of the few counties in the state which had zero fire deaths in 1985.

The number of reported arson incidents in the County remained the same for both 1984 and 1985 at 6.

MONTGOMERY COUNTY

Population: 590,530



Montgomery County ranked 4th in the state during 1985 in total fire incidents. There were 1,124 structure fires, 839 vehicle fires and 2,157 outside fires, for a total of 4,120 reported fire incidents. These incidents resulted in the loss of approximately $8,064,840 in property damages.

Montgomery County also experienced an excellent record in reducing fire deaths during a 15-month period beginning in 1984 and ending in 1985 with zero fire deaths.

Arson,. however, increased sharply during the past year, with a reported 634 arson offenses in 1985 as compared with 511 such incidents in 1984.

PRINCE GEORGE'S COUNTY

Population: 667,090

Prince George's County ranked 1st in the state in 1985 in total fire incidents. The County sustained 9,646 structure fires, 2,145 vehicle fires and 396 outside fires, for a total of approximately 12,187 fire incidents.

Additionally, fires damaged an estimated $16,640,250 in property.

The County also ranked 4th in the state last year in fire deaths with a total of 7.

Arson increased only slightly during 1985, with a reported 248 incidents as compared with 244 such cases in 1984.

QUEEN ANNE'S COUNTY

Population: 26,760

Queen Anne's ranked 14th of the counties in Maryland during 1985 in total fire incidents. There were 344 structure fires, 86 vehicle fires and 153 outside fires, for a total of 583 fire incidents. These fire incidents resulted in an estimated $1,639,390 in property either destroyed or damaged.

Queen Anne's was also one of the seven counties in the state which had zero fire deaths in the past year.

Arson rose, however, during 1985 with 17 reported cases as compared with 13 arson offenses in 1984.

ST. MARY'S COUNTY

Population: 59,830

St. Mary's County ranked 9th in the state last year in total fire incidents. There were 660 structure fires, 119 vehicle fires and 373 outside fires, for a total of 1,152 fire incidents. The property destroyed or damaged by fire in the County amounted to approximately $1,526,549.

St. Mary's was also one of the few counties in the state which did not have a fire death reported in 1985.

Arson rose sharply in the County during 1985 with 26 reported cases as compared with 19 such incidents in 1984.

SOMERSET COUNTY

Population: 19,030

Somerset County ranked 19th in the state during 1985 in total fire incidents. There were a total of 97 structure

FIRE SUMMARY BY JURISDICTION *(continued)*

SOMERSET COUNTY *(continued)*

fires, 49 vehicle fires and 89 outside fires, for a total of 235 fire incidents in the County. These fires accounted for approximately $714,870 in property damages.

Somerset sustained 3 fire deaths during 1985.

Arson climbed dramatically in the County during the past year as compared with 1984. There were 19 reported arsons during 1985 as opposed to only 5 such incidents in 1984. This sharp increase in arson in Somerset ranked it second only to Dorchester County in a rise in arson offenses on the Eastern Shore in 1985.

TALBOT COUNTY

Population: 26,780

Talbot County ranked 18th among the various jurisdictions in the state last year in total fire incidents. There were 153 structure fires, 38 vehicle fires and 82 outside fires, for a total of approximately 273 fire incidents. Fires in the County destroyed or damaged approximately $461,550 in property.

Talbot was also one of the fortunate counties which did not suffer any fire fatalities during the year.

Arson declined during 1985 in Talbot, with a reported 8 incidents as compared to 15 such cases in 1984.

WASHINGTON COUNTY

Population: 112,580

Washington County ranked 7th in the state last year in terms of total fire incidents. There were 778 structure fires, 252 vehicle fires and 367 outside fires, for a total of 1,397 fire incidents. Damages from these fires amounted to approximately $2,148,848.

Only 1 civilian died as the result of fire in the County during 1985.

Arson offenses increased slightly last year with 58 reported incidents as compared with 53 such cases in 1984.

WICOMICO COUNTY

Population: 64,890

Wicomico County ranked 13th of the jurisdictions in the state last year in total fire incidents. There were 298 structure fires, 130 vehicle fires and 225 outside fires, for a total of 653 reported fire incidents. Additionally, these fires caused an estimated $1,110,629 in property damages.

WICOMICO COUNTY *(continued)*

Wicomico also tied with Prince George's County ranking 4th among all jurisdictions with a total of 7 fire deaths during 1985.

Arson offenses increase by 10 reported cases last year, with 33 incidents tallied in 1985 as compared with 23 in 1984.

WORCESTER COUNTY

Population: 31,480

Worcester County ranked 22nd in the state during 1985 in total fire incidents. There were 109 structure fires, 46 vehicle fires and 33 outside fires, for a total of 188 fire incidents. Damages from these fires were estimated at approximately $613,300.

Worcester was one of the few counties in the state last year that had zero fire deaths.

Arson offenses declined in the County during 1985, with 11 reported cases as compared with 17 such incidents in 1984.

* The county fire incident summaries data was compiled by the Maryland Fire Incident Reporting System.

** No summary information is provided in this report for Baltimore or Carroll Counties, as neither county participated in the MFIRS program during 1985. Both of these counties have begun participating in the program in 1986 and their data will be presented in next year's report.

Selected Statistical Data By County And Department

ALLEGANY COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Cumberland Fire Dept.	1,167	93	182	298	91	57	235,775
LaVale Vol. Fire Dept.	223	24	9	79	24	9	49,625
Bedford Road Vol.	98	8	4	46	30	2	100,500
Baltimore Pike Vol.	95	4	28	22	13	13	7,340
Corriganville Vol.	33	7	1	6	19	-	30,000
Ellerslie Vol.	27	4	2	6	12	-	300
District Sixteen Vol.	79	6	4	20	17	7	59,201
Bowling Green Vol.	77	22	3	10	17	1	1,650
Community Vol.	154	13	8	43	26	6	43,148
Bowman's Addition Vol.	29	4	2	3	16	1	35,050
Flintstone Vol.	72	2	4	32	14	6	61,650
Oldtown Vol.	72	13	4	16	14	7	8,075
Clarysville Vol.	75	8	2	35	8	3	750
Mount Savage Vol.	45	5	-	16	10	1	56,100
Frostburg Vol.	221	51	36	44	17	15	92,330
Shaft Vol.	107	10	21	15	36	7	5,700
Midland Vol.	47	9	5	12	11	2	800
Barton Hose Co.	74	22	-	26	14	2	43,350
Goodwill Fire Co.	86	19	1	33	10	2	35,500
Luke Vol.	3	2	-	-	-	-	-
Potomac Vol. Fire Co.	136	41	3	46	18	4	10,300
McCoole Vol. Fire Co.	141	10	-	74	21	2	226,200
Orleans Fire Co.	61	7	4	19	8	2	28,400

ANNE ARUNDEL COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Galesville Vol.	396	12	38	130	111	17	38,578
Woodland Beach Vol.	848	63	74	314	157	26	245,135
Riva Vol.	630	21	73	178	187	11	121,910
Waugh Chapel Fire Station	725	43	88	231	142	52	317,110
Herald Harbor Vol.	534	38	40	216	90	12	171,079
Arundel Vol.	1,013	83	87	359	188	21	54,925
Paramedic 8	259	4	7	164	13	2	182,425
Harwood Lothim Fire Dept.	89	-	6	58	15	3	2,200
Orchard Beach Vol.	419	92	22	86	82	15	48,797
Earleigh Heights Vol.	1,485	144	143	454	305	42	307,499
Rivera Beach Vol.	1,102	84	54	387	130	58	360,658
Green Haven Vol.	928	94	41	257	233	25	364,217
Powhatan Beach Vol.	805	103	69	261	170	21	84,229
Lombardee Beach Vol.	203	90	10	35	27	4	8,595
Arnold Vol.	805	69	123	246	151	31	81,734
Marley Vol.	1,328	75	157	413	180	69	642,325
Cape St. Claire Vol.	527	47	74	157	44	25	94,802
Lake Shore Vol.	768	38	48	260	100	29	146,445
Hermans Dorsey Fire St.	876	43	74	459	119	42	1,215,445
Jones Station	1,209	67	117	516	284	40	225,320
7th Dist. Rescue Squad	1	-	-	1	-	-	-
South Glen Burnie Station	1,477	41	178	502	194	121	601,502
Maryland City Vol.	648	50	56	211	108	35	120,764
Odenton Vol.	1,339	79	134	519	206	58	358,220

ANNE ARUNDEL COUNTY *(continued)*

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Jessup Vol.	622	24	93	204	148	39	2,288,149
Brooklyn Vol.	1,295	83	77	642	123	78	426,455
Linthicum Fire Co.	1,107	53	160	349	268	60	378,092
Glen Burnie Vol.	2,290	86	235	1,096	435	84	214,363
Ferndale Vol.	1,187	169	128	337	229	22	82,853
West Annapolis Fire Co.	1,087	129	147	397	156	38	888,131
Avalon Shores Vol.	309	35	13	91	57	9	89,699
Deale Vol.	614	29	34	286	95	17	5,300,800
Battalion 1	946	6	207	95	413	14	-
Battalion 2	731	7	119	84	360	18	-
Battalion 3	554	6	111	101	223	11	-
Battalion 4	566	5	91	69	284	9	-
Fire Investigation Bureau	13	-	1	-	5	7	15,950

CITY OF ANNAPOLIS

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
27035	891	9	105	297	94	28	108,835
27036	1,386	33	122	835	92	25	554,824
27037	94	3	15	22	9	-	5,900
27038	1,206	20	131	618	70	24	327,599
27039	479	14	155	21	56	3	315
27040	1	-	-	-	1	-	-

BALTIMORE CITY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
	55,045	7,218	10,098	24,527	4,165	1,625	20,149,363

BWI AIRPORT

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
	1,158	87	82	721	36	21	32,460

CALVERT COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
North Beach Vol.	459	41	5	148	105	15	363,357
Calvert Co. Vol.	610	114	26	150	123	36	329,729
Solomons Vol.	310	43	12	91	43	10	647,550
Dunkirk Vol.	388	39	19	74	127	14	118,908
Huntingtown Vol.	426	55	20	96	103	13	199,499

CAROLINE COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Federalsburg Vol.	148	3	8	52	27	11	185,300
Preston Vol.	91	1	3	21	21	8	103,175
Denton Vol.	171	11	21	57	36	10	148,550
Ridgely Vol.	124	6	8	35	44	3	34,749
Mary-Del Vol.	74	1	-	46	15	2	1,150
Greensboro Vol.	119	16	7	44	25	2	1,650
Goldsboro Vol.	100	8	-	19	46	6	37,399

CECIL COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Cecilton Vol.	98	7	-	25	23	10	1,536,100
Chesapeake City Vol.	147	32	15	30	15	8	3,000
Singerly Vol.	699	30	43	247	97	55	2,042,074
Northeast Vol.	356	24	11	85	68	26	279,629
Charlestown Vol	91	21	4	19	26	3	10,586
Perryville Vol.	173	18	6	54	31	16	74,498
Port Deposit Fire Dept.	273	22	3	91	38	3	71,420
Rising Sun Fire Dept.	320	31	8	76	104	15	426,750
Hacks Point Fire Dept.	44	2	1	18	5	1	5,000

CHARLES COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
LaPlata Vol.		NOT PARTICIPATING					
Hughesville Vol.		NOT PARTICIPATING					
Waldorf Vol.	1	-	-	-	-	-	-
Nanjemoy Vol.		NOT PARTICIPATING					
Benedict Vol.		NOT PARTICIPATING					
Fifth District Vol.		NOT PARTICIPATING					
Potomac Heights Vol.	53	4	4	12	21	1	8,455
Tenth District Vol.	131	14	11	42	24	6	54,000
Indian Head Vol.	84	21	6	17	21	4	12,550
Bel Alton Vol.		NOT PARTICIPATING					
Bryans Road Vol.	249	33	8	104	49	13	30,840

DORCHESTER COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Rescue Fire Co.	232	3	4	5	43	25	134,330
Hurlock Vol.	48	-	7	18	6	3	19,000
Vienna Vol.	19	2	-	6	-	4	8,200
Secretary Vol.	4	-	-	-	-	1	198
East New Market Vol.	28	1	-	15	5	-	17,500
Eldorado-Brookview Vol.	14	-	1	-	6	3	203
Neck District Vol.	6	-	-	1	-	-	50
Lloyd Vol.	26	1	3	2	8	-	6,800
Lakes & Straits Vol.	2	-	-	-	1	-	-
Church Creek Vol.	17	1	1	-	7	2	16,004
Madison Vol.	4	-	-	-	-	1	-
Linkwood-Salem Vol.	23	2	1	1	4	6	7,050
Taylor's Island Vol.	2	-	-	-	1	-	-

FREDERICK COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Independent Fire Dept.	640	18	85	210	80	41	110,692
Juniors Fire Dept.	563	15	73	185	90	35	156,700
United Steam #3	902	84	111	333	97	42	184,035
Citizens Fire Dept.	356	20	107	8	140	6	-
Brunswick Vol.	226	27	5	42	34	3	136,800
Emittsburg Fire Dept.	243	19	34	51	67	15	52,775
Middletown Vol.	289	51	11	103	18	5	34,950
Myersville Vol.	142	18	3	42	28	16	28,450
New Midway Vol.	210	48	6	87	36	6	119,600
Thurmont Fire Dept.	203	20	9	74	66	4	39,575
Walkersville Fire Dept.	200	12	8	48	68	15	49,115
Braddock Heights Vol.	212	18	13	48	61	13	19,750
Rocky Ridge Vol.	108	1	8	45	39	1	55,450
Carroll Manor		NOT	PARTICIPATING				
New Market Dist.	401	42	17	102	96	21	185,890
Woodsboro Vol.	171	7	5	59	85	1	167,100
Libertytown Vol.	159	5	9	41	55	8	19,800
Graceham Vol.	47	2	4	8	18	1	51,100-
Jefferson Fire Dept.	185	13	17	41	48	6	337,465
Wolfsville Vol.	130	14	-	69	25	1	51,100
Lewistown Fire Dept.	171	51	19	37	12	5	125,269
Urbana Fire Dept.	274	27	62	62	84	15	187,425
New Market Green Valley	5	2	-	-	2	-	100

GARRETT COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Bloomington Vol.	104	37	4	24	5	5	13,300
Friendsville Community Vol.	37	3	-	16	6	3	381,400
Gorman Vol.	43	7	1	16	11	5	54,100
Deer Park Comm.	111	2	27	25	37	3	53,340
Deep Creek Vol.	101	8	7	39	17	6	63,100
Oakland Vol.	318	115	34	44	46	10	734,470
Accident Vol.	38	1	-	8	14	1	28,150
Grantsville Vol.	129	34	1	34	24	7	59,120
Kitzmiller Vol.	30	6	2	4	4	3	20,700
Eastern-Garrett City Vol.	41	4	1	5	9	1	1,500
Bittinger Vol.	33	5	1	7	11	-	100,000

HARFORD COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Level Vol.	278	12	15	81	88	15	77,500
Aberdeen Vol.	329	20	48	25	70	30	122,000
Bel Air Vol.	1,027	32	82	412	184	46	1,490,689
Abingdon Vol.	635	25	37	274	61	37	265,201
Susquehanna Hose	349	9	56	67	81	19	189,105
Delta-Cardiff Vol.	169	2	2	69	55	9	60,230
Jarrettsville Vol.	388	10	15	105	139	16	272,335
Joppa-Magnolia Vol.	635	27	39	220	70	50	640,874
Darlington Vol.	279	10	17	84	111	7	95,900
Citizens Vol.	100	1	5	22	53	2	545
Aberdeen Proving Ground	1	-	-	-	1	-	-
Fallston Vol.	323	30	20	113	56	15	99,960

HOWARD COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Elkridge Vol.	791	38	104	322	92	41	150,339
Ellicott City Vol.	677	26	74	351	48	36	339,755
West Friendship Vol.	374	37	26	129	61	11	187,040
Lisbon Vol.	260	9	25	89	36	13	84,704
Fifth Dist. Vol.	282	24	27	82	24	11	242,290
Savage Vol.	1,049	29	170	319	120	75	769,747
Banneker Road Vol.	972	22	175	385	69	36	260,780
Bethany Lane Station	313	10	48	76	25	24	53,225
Tamar Drive Station	990	56	164	387	70	42	249,514
JHU Lab Fire Dept.	260	2	104	55	14	9	9,110

KENT COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Millington Vol.	174	4	-	97	39	7	14,100
Galena Vol.	93	4	-	41	18	2	211,700
Kennedyville Vol.	61	1	3	6	27	1	99,000
Betterton Vol.	80	2	4	47	11	2	2,000
Chestertown Vol.	255	4	17	52	55	25	409,799
Rock Hall Vol.	81	-	4	19	24	6	119,299

MONTGOMERY COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
	4,120	2,173	3,472	-	1,124	839	$8,064,840

The totals listed for Montgomery County are a combined total of the County as supplied by each of the fire departments in Montgomery County.

PRINCE GEORGE'S COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
1	1,491	54	15	345	155	34	
2	904	14	4	183	137	12	
3	1,128	54	13	458	141	27	
4	593	36	8	63	182	20	
5	845	18	3	264	318	13	
6	1,545	68	20	194	222	37	
7	1,111	74	7	243	213	23	
8	1,783	63	26	788	403	50	
9	1,388	83	29	386	259	66	
10	1,441	83	12	289	204	93	
11	1,467	39	27	397	274	89	
12	1,577	74	99	334	145	32	
13	879	40	11	272	249	53	
14	1,644	46	7	466	268	37	
17	1,190	31	16	202	179	28	
18	740	22	2	161	82	13	
19	542	36	4	114	136	21	
20	1,240	48	4	244	142	36	
21	1,222	48	15	269	430	32	
22	1,254	21	9	354	428	28	
23	1,029	27	16	374	220	91	
24	496	6	2	144	68	26	
25	1,378	44	17	416	166	51	
26	1,788	77	40	392	225	62	
27	2,093	59	21	877	526	39	

PRINCE GEORGE'S COUNTY *(continued)*

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
28	1,458	71	28	331	135	75	
29	2,369	137	44	846	278	119	
30	966	42	13	180	139	48	
31	1,067	22	5	284	112	48	
32	1,015	37	9	273	393	34	
33	2,832	131	62	1,472	371	129	
34	1,374	80	28	337	185	41	
35	982	32	3	257	117	82	
36	404	1	1	146	76	10	
37	804	25	9	306	118	26	
38	906	32	25	278	251	54	
39	982	30	6	280	107	47	
40	830	18	3	249	143	44	
41	921	39	6	217	111	55	
42	1,390	78	39	424	280	73	
43	687	29	4	196	110	43	
44	1,068	71	9	274	170	32	
45	418	13	1	116	81	13	
46	945	54	6	412	131	76	
47	847	45	9	353	149	41	
48	974	84	8	267	175	36	
49	942	38	9	471	172	4	
R1	4,259	6	14	4,068	38	1	
R3	3,910	6	13	3,748	22	1	

QUEEN ANNE'S COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Kent Island Vol.	223	4	10	90	39	13	25,255
Grasonville Vol.	279	18	20	65	56	15	549,375
Queenstown Vol.	182	2	15	51	67	10	1,495
Goodwill Vol.	156	8	12	44	32	20	334,600
Church Hill Vol.	127	8	11	24	47	6	198,550
Sudlersville Vol.	98	6	5	18	38	11	191,750
Crumpton Vol.	88	7	1	50	19	1	128,650
Queen Anne-Hillsboro	173	6	6	93	28	3	147,325
United Comm. Vol.	66	-	6	18	17	1	57,390

ST. MARY'S COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Leonardtown Vol.	315	15	37	36	122	21	694,464
Mechanicsville Vol.	318	14	15	33	99	36	170,131
Bay Dist. Vol.	439	17	51	27	127	28	197,709
Ridge Vol.	98	11	2	25	24	6	27,061
Seventh Dist. Vol.	117	6	1	29	44	5	141,450
Second Dist. Vol.	205	2	9	26	111	4	147,300
Hollywood Vol.	343	34	22	31	133	19	148,434

SOMERSET COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Ewell Vol.		NOT PARTICIPATING					
Crisfield Vol.	72	3	5	-	27	11	22,548
Marion Vol.	54	2	5	1	8	8	31,925
Deal Island-Chance Vol.	20	-	1	-	8	3	259,000
Princess Anne Vol.	152	2	13	8	50	26	369,397
Mt. Vernon Vol.	19	3	-	1	4	1	32,000

TALBOT COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Oxford Fire Co.	42	8	1	7	15	-	17,300
Trappe Vol.	78	6	6	25	15	6	50,050
St. Michael's Vol.	119	1	12	36	30	4	128,850
Cordova Vol.	94	9	2	24	26	5	75,575
Easton Vol.	455	13	56	133	56	22	159,750
Tilghman Vol.	31	1	1	6	11	1	30,025

WASHINGTON COUNTY

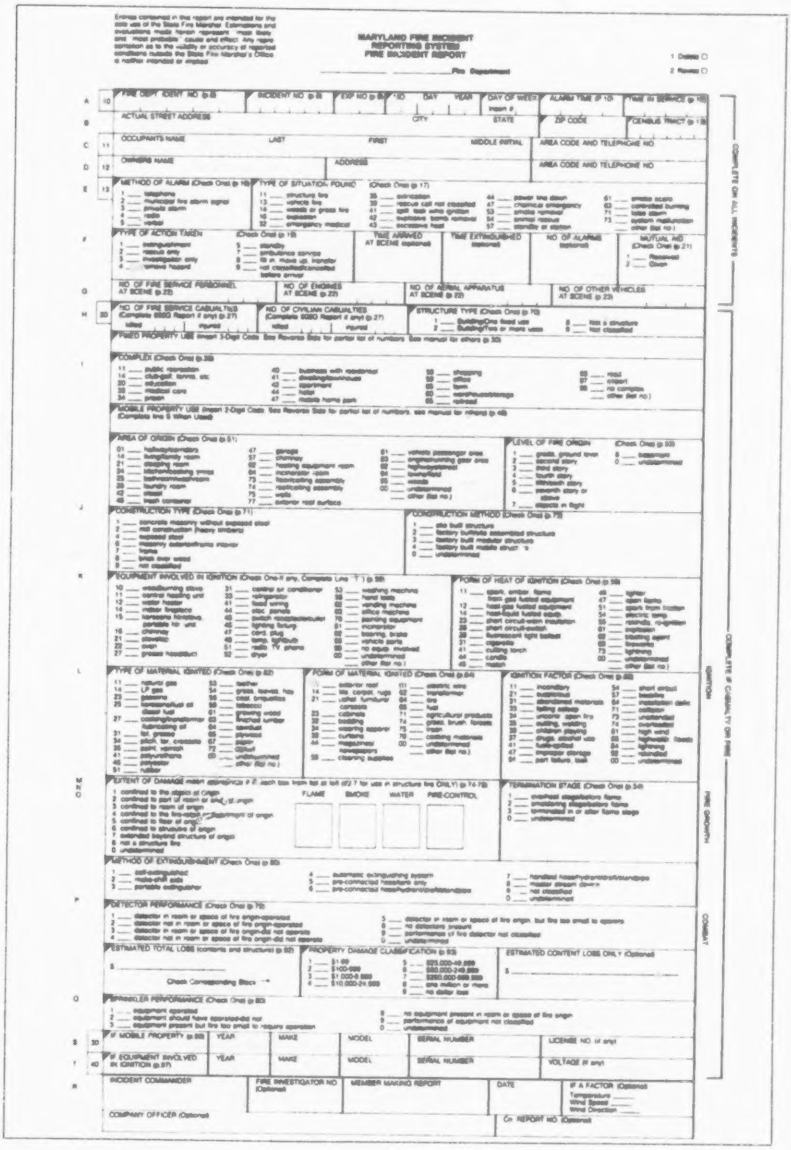
Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Sharpsburg Vol.	170	26	12	19	55	8	150
Williamsport Vol.	483	28	43	164	72	23	200,380
Clear Spring Vol.	173	22	9	46	42	12	46,150
Hancock Vol.	274	31	10	109	48	25	238,100
Boonsboro Fire Dept.	232	26	14	42	73	14	-
Smithsburg Vol.	232	10	11	65	58	11	50,100
Lettersburg Vol.	101	15	9	30	21	5	-
Funkstown Vol.	307	34	48	69	50	21	94,491
Potomac Valley Fire Co.	135	3	-	35	27	15	-
Fairplay Comm. Vol.	206	18	16	105	31	2	118,775
Goodwill Vol.	309	27	33	99	65	14	132,086
Mt. Aetna Vol.	165	17	11	78	17	6	29,100
City of Hagerstown	1,214	124	228	119	101	58	1,199,731
Halfway Vol.	592	45	49	338	61	30	36,910
Long Meadow Vol.	287	22	35	122	48	5	100
Blue Ridge Summit Vol.	2,075	2	-	2	7	3	2,075

WICOMICO COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Salisbury No. 1	620	22	121	59	121	57	401,174
Salisbury No. 2	379	25	69	38	69	25	268,917
Fruitland Vol.	151	1	18	15	26	16	337,500
Delmar Vol.	44	6	2	15	7	2	7,700
Hebron Vol.	121	8	16	18	19	5	7,000
Parsonsburg Vol.	101	1	9	27	20	13	34,100
Pittsville Vol.	39	7	1	14	7	1	2,100
Willards Vol.	16	-	-	6	3	1	2,500
Mardela Springs Vol.	28	1	2	12	5	-	-
Powellville Vol.	6	1	-	2	2	1	5,000
Westside Vol.	24	-	3	7	4	1	1,800
Sharptown Vol.	47	9	4	10	6	4	42,130
Allen Vol.	22	1	-	2	7	3	200
Salisbury Hdqtrs.	7	-	-	-	2	1	508

WORCESTER COUNTY

Company	Total Incidents	Service Calls	False Calls	Rescue Calls	Structure Fires	Vehicle Fires	Total Est. Dollar Loss
Pocomoke City Vol.	23	-	2	-	10	5	50,150
Stockton Vol.	21	-	-	12	7	-	2,650
Girdletree Vol.	10	-	1	1	5	1	97,600
Snow Hill Vol.		NOT PARTICIPATING					
Newark Vol.	8	2	2	1	1	1	1,000
Berlin Vol.	31	-	2	6	8	5	183,460
Ocean City Vol.	563	8	157	125	64	31	225,740
Showell Vol.	13	-	2	3	4	1	19,500
Bishopville Vol.	27	3	1	15	3	-	10,000
Ocean Pines Vol.	15	1	-	3	7	2	23,200



MARYLAND FIRE INCIDENT
REPORTING SYSTEM
FIRE INCIDENT REPORT

Dedication

Pride

Service

THE MARYLAND STATE FIRE MARSHAL'S OFFICE

In Appreciation

It is with great pride that we express our thanks to those individuals and organizations who assisted in the production of Fire In Maryland 1985. They are:

Mr. Richard A. Tamberrino and Mr. Thomas Stough, Department of Public Safety and Correctional Services for the computer graphic analysis of Fires and Fire Deaths; Deputy Chief Allen Ward, Deputy Fire Marshal Mike Bond and Fire Protection Engineer Ken Bush, Maryland State Fire Marshal's Office; Al Bagley, A Touch of Memories, John Gallagher, Bel Air Fire Company, and Jim Schoettler, The Aegis, Bel Air, Maryland for photographs used in this report.

We also wish to thank the staff of the State Fire Marshal's Office for their assistance with this project. Special recognition is also paid to Mr. Daniel B. Smith, Jr. and the Printing Press publisher of the report.

Finally, we want to express our appreciation and thanks to the Maryland State Firemen's Association and the Fire Service of Maryland for their support of the Maryland Fire Incident Reporting System.

Shirley Fennell-Kelso
Administrative Aide
MFIRS Coordinator

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Deputy Chief
State Fire Marshal

A SMOKE DETECTOR
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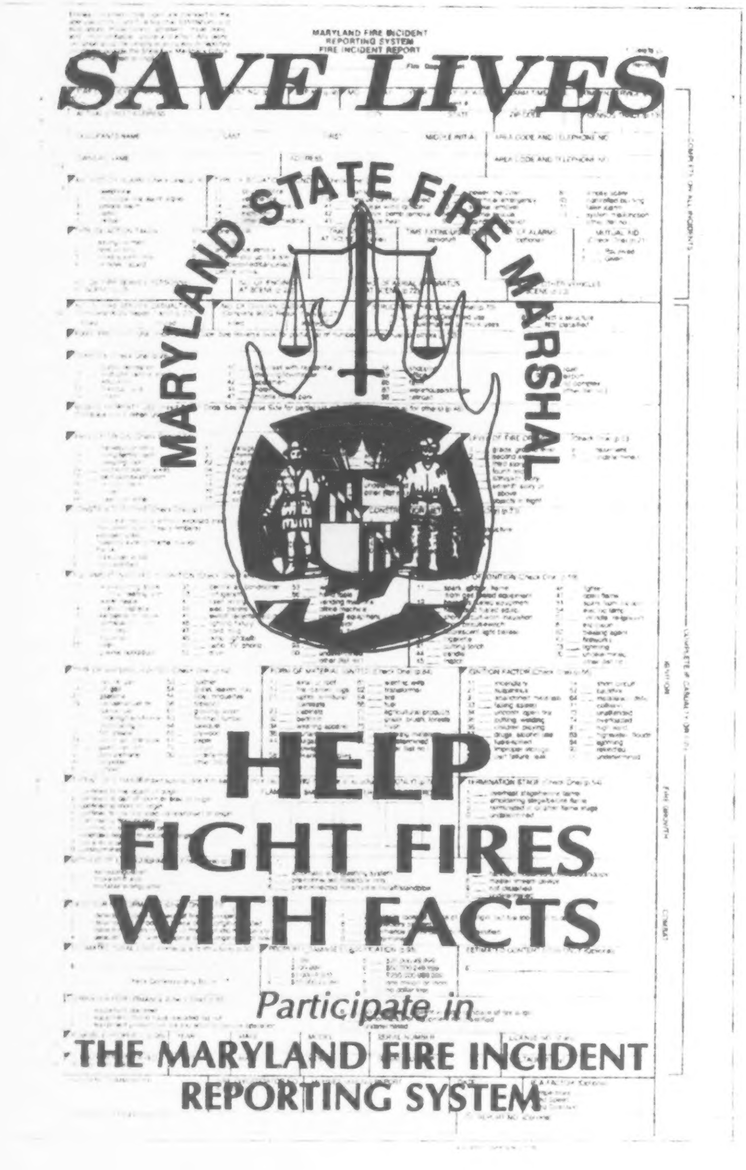
YOUR LIFE


MARYLAND FIRE INCIDENT
REPORTING SYSTEM
FIRE INCIDENT REPORT
SAVE LIVES
MARYLAND STATE FIRE MARSHAL
HELP
FIGHT FIRES
WITH FACTS
Participate in
THE MARYLAND FIRE INCIDENT
REPORTING SYSTEM

Senator **Sarbanes**. Thank you very much, Mr. Gabriele.

Mr. Frazier, please proceed.

STATEMENT OF JOHN R. FRAZIER, BUREAU CHIEF, BALTIMORE CITY FIRE DEPARTMENT

Mr. **Frazier**. Mr Chairman, honorable members of the Joint Economic Committee of the Congress of the United States, thank you for allowing me to address this committee on behalf of the Baltimore City Fire Department.

The Baltimore City Fire Department, which serves a population of some 750,000 citizens, is charged with a mission to provide protection to lives and property from fire, public fire education, and medical services. The fact that Baltimore is a major seaport, industrial center, and railhead provides not only its economic sustenance, but also its occupational diversity. The city's industries include tourism, food processing, metal and oil refining, and the production of chemicals, to name but a few. Over 25.4 million tons of cargo of every description were handled in the Port of Baltimore in 1985.

Clearly, the City of Baltimore relies heavily upon the fire department to provide protection at a level which is commensurate with the needs of every citizen, both in the home as well as the work place. This undertaking requires not only enormous sustained resources to maintain the current level of protection, but also must provide for planning, research, and evaluation in anticipation of improvements in methods of fire prevention and suppression, and for monitoring the technological changes in industry to keep us abreast of what is evolving in the community we serve.

In view of the foregoing and, due to the strain on municipal funds, the impending elimination of general revenue sharing funds cannot help but have an unforgiving negative impact on the Baltimore City Fire Department's ability to deliver the same increasingly sophisticated and costly level of fire protection that is required.

Baltimore City has met the growing costs of fire service in part by reliance on Federal general revenue sharing funds. For the past 3 years, 1983, 1984, and 1985, the general revenue sharing funds comprised $17.5 million, $15.6 million, $15.7 million, of the Baltimore City Fire Department's operating budget. This represents a cumulative sum of $48.7 million of the aggregate of $180.9 million operating budget during the 3-year period.

It goes without saying that the loss of these funds will result in a curtailment in fire prevention, research, and safety activities or an equivalent reduction in other city services.

Regarding social costs, the risk to life and limb is of utmost concern in Baltimore; while there is no way to forecast with reasonable accuracy the impact of a reduction in fire service funding, the increased threat to the physical safety of Baltimore's population ranks highest in the fire service's priorities. Indirect costs would also include the loss of employment possibilities, increased insurance costs in both homes and industry, and diminished fire loss management.

In addition to the need for supplementing local ability to provide public service, there is a further direct role which the Federal Government must fulfill. It is only at the national level that data on the many aspects of fire prevention, the threats in industrial settings, and suppression techniques, for example, can be effectively collected, analyzed, and disseminated. In this area, the highest priority should be accorded to the development of programs designed to reduce injuries and fatalities.

In Baltimore City, we are proud of three programs which were developed following extensive research which greatly relied on national data available because of Federal programs. These are Juvenile Fire Setter Intervention, Hazardous Material Control, and Public Education with regard to installation and maintenance of smoke detectors.

Both local and national statistics indicate that juvenile firesetting represents a serious local and national concern. Whether we weigh the cost in terms of property loss, fatalities, or human pain and suffering, fires caused by children present a substantial risk to our communities and our children themselves.

The good things that chemicals bring into our lives have become indispensable to us. The fire service, however, with every increasing incident, is being confronted with emergencies and efforts must be made to ward off indifference and complacency.

The public must be reminded that periodic testing and maintenance of smoke detectors is an ongoing chore. Upgrading and replacement of existing units is likewise essential when damage or defects are discovered or a change in residential living arrangements require additional units or relocation of smoke detectors to accommodate interior modifications.

These merely illustrate the many problems and tasks which urban fire departments face in our increasingly complex society. Without the continued technical support of each component of the U.S. Fire Administration and their ability to collect data, interface with the greatest number of fire service experts and ancillary parties in both the public and private sectors to refine and disseminate the same, the clock of progress will be turned back.

Senator **Sarbanes**. Thank you very much, Chief.

Mr. Droneburg, please proceed.

STATEMENT OF JOHN W. DRONEBURG, REGIONAL COORDINATOR, MARYLAND FIRE AND RESCUE INSTITUTE, REPRESENTING THE FREDERICK COUNTY BOARD OF COUNTY COMMISSIONERS AND THE FREDERICK COUNTY FIRE AND RESCUE ASSOCIATION

Mr. **Droneburg**. Thank you. It's a pleasure to be here with you today. I'd like to thank the Board of Frederick County Commissioners and the local fire service for the opportunity to testify and to be with you this morning.

I'd like to touch on three points briefly in the comments. The first are the National Fire Academy, the second, the Federal support of local fire programs, and the third, the identity of the fire service as a whole and related to the Federal focus.

In looking at the impact on the local level and using Frederick County as an example throughout the United States, the National Fire Academy is a very important link in the chain of fire service training. As we all in this room know, the National Fire Academy has been under attack in the Federal budget system for several years. There are some inadequacies in the program, certainly, but the National Fire Academy provides a national focus for training which can't be duplicated anywhere else.

We need to realize the importance of the National Training Center for Fire Service Personnel. We need to support the type of interactive learning which can only occur when people are brought together from across the Nation to study and to share ideas. This is learning and education which will truly benefit the citizens of the cities and communities across the Nation.

The education of fire service officers and leaders which occurs at the National Fire Academy is perhaps the most important measurement and important idea that can be found in the National Fire Academy system.

Perhaps we need to survey those who attended the National Fire Academy and measure the local dollars that have been saved, or the property that has been saved, or the lives that have been saved, and use this measurement to justify the existence of the National Fire Academy system. It's a difficult measurement, for sure, but it's something that we urge you and your committee to continue to look at, and your fellow legislators.

The fire service is the most important link in the protection of life and property in almost every situation. The action taken in the first few minutes of any incident has proven to be the most critical to the outcome of the problem. Let's change our philosophies and move the training of those who arrive first and bear the burden of initial decisions to a place foremost in our Federal focus and funding.

We urge you to continue the National Fire Academy. We urge you to continue it and to implement its larger realm and its additional personnel which have been funded, but have not been allowed in the last several years.

Another area of concern for the fire service personnel is the support of local fire programs by Federal revenue sharing and other Federal programs.

It's obvious that in almost any emergency services system, the financial support of the local government agency is paramount to the continued existence of the emergency services system. Although we feel that this is a financial responsibility that should be borne by the local government, it would appear that the continued reduction of Federal funds to local jurisdictions would further curtail the ability of these jurisdictions to adequately fund public safety programs.

The Federal county system can be viewed as an example of the need for governmental support. It has been proven cost effective for Frederick County to operate predominantly with a volunteer system with a few full-time paid personnel. Even with this volunteer system, the financial support of city and county government agencies is essential. The workload on the volunteer is such that fundraising is becoming an ever increasingly more difficult task. We believe that a close examination of the fire service programs throughout the country would show the same effect.

It would seem that the most effective approach to maintaining Federal assistance to the local fire and emergency services programs would be to continue to provide revenue sharing or other funding programs with certain percentages of dollars earmarked for public safety.

I think it would be justified for the Federal Government to assure that funds allocated for public safety were being spent to the best benefit of all. With a controlled system of expenditures to the local government units for common good, it would seem the continued spending levels would be amply justified.

The last area which I'll address in testimony is the overall picture of the fire service in relation to the Federal programs and focus.

We must recognize that there is, indeed, a fire problem, as we have illustrated in the past. We feel that the Federal role is to continue to focus on this fire problem and to continue to bring to light new technologies and methods for preventing and combating fire. The Center for Fire Research has had a tremendous impact on the knowledge base available in the science of fighting fire. Programs such as this can only be effective on the Federal level so that all may benefit from the knowledge gained.

National seminars such as the National Fire and Burn Safety Symposium should be reviewed by the Federal system as they are a major benefit in bringing innovations and ideas from all across the Nation to a single point and provide a tremendous vehicle for dissemination of information.

Again, programs such as these can be effective only on the Federal level. The continued support and creation of additional national data banks for fire safety information is critical to the continued success of the fire programs. National programs to support smoke detectors and residential sprinklers would save lives across the Nation.

The Federal support of these life-saving technologies would be a major benefit to all citizens throughout the Nation. This, again, can only reach everyone with an effective and well-coordinated national program.

The Federal Government must realize that public protection from fire and accident is a major concern to be addressed. We should not allow the safety of the citizens to take a backseat to any other programs. We have the abilities and technologies to make the United States more fire safe. We must realize the importance of these programs at election and budget times to continue to provide the public protection which can be the best in the world.

In conclusion, I'd like to point out that public safety is one of the major problems facing the legislators of today. There are problems in the current systems and the further reduction of funds to the local level operating units and to the national fire programs would have a profound and noticeable effect on the ability to protect our citizens.

It should be remembered that protection from fire and accident is only evident when it is not provided. It would be foolish to lose the progress made to this point with the loss of funding and programs. Let's focus on the fire safety programs and justify these programs on their own merits.

I think you will find that the public support of every person who deals with or votes on the Federal budget can sleep better at night knowing that the best has been done to provide protection for themselves and everyone.

Thank you, sir.

[The prepared statement of Mr. Droneburg follows:]

PREPARED STATEMENT OF JOHN W. DRONEBURG

This testimony is submitted representing the Board of Frederick County Commissioners and the Frederick County Volunteer Fire and Rescue Association. The opinions contained herein are mine and those of the above named groups and are not meant to reflect the official position of my employer.

It is a pleasure to be able to address some of the needs and problems of the local fire service in relation to Federal funding and programs. I would like to address three major areas of concern. These areas are the National Fire Academy, the Federal support of local fire programs and the identity if the fire service as a whole as related to the Federal focus.

The National Fire Academy has been under attack in the Federal budget system for several years. While there are some inadequacies in the program and system, the Fire Academy provides a national focus for fire training that is vital to the continued success of fire ~~service~~ forces across the United States. In examining the system, it can be seen that the National Fire Academy has led a stepchild existence since its beginning. While under FEMA and the USFA the Fire Academy has had to continually fight for its place in these large Federal bureaucracies. Many fire service officials and lawmakers tell us that the Academy must be kept under the larger organizations to maintain its existence at all. My question to this logic is why ? We need to realize the importance of a National training center for fire service personnel. We need to support the type of interactive learning which can only occur when people are brought together from across the nation to study and share ideas together and solve problems in a learning environment. This is the learning and education which will truly benefit the citizens of cities and communities across the nation. This education of the Fire Service officers and leaders can only lead to a better protected nation. Perhaps the problems arises from the measurement of the results of the learning which takes place at the National Fire Academy. Perhaps we need to survey those who have attended and measure the local dollars that have been saved, or the property value that has been saved, or the human lives that have been saved all due to a better educated fire service. It certainly is a difficult measurement, but I am sure you would find ample justification for the dollars spent in the training programs. I am sure that the National Fire Academy alone could exist on its own merit rather than buried in other organizations and fighting for its existence yearly.

Lets consider some of the problems which have recently surfaced within FEMA. A review of these problems will show that the National Fire Academy has continued to fulfill its mission to the best of its ability throughout the political fighting and alleged corruption. Look at the picture as a whole, no matter how much planning and training is done by FEMA and EMI, when the fire, accident, or disaster occurs, it will be the fire service that will be first on the line to control or maintain the situation until "civil defense" help can arrive, hours or days after the incident. Let's face the fact that the fire service is the most important link in the protection of life and property in almost every situation. The action taken in the first few minutes of any incident have proven to be the most critical to the outcome of the problem. Let's change our philosophy and move the training of those who will arrive first and bear the burden of initial decisions to a place foremost in our Federal focus and funding rather than buried under a sea of bureaucratic agencies fighting for existence. I urge you to continue your investigative work to determine the most important link in the protection of the lives and property of our citizens throughout the United States. I am confidant that you will find that the Fire Service is the initial and most critical link in this chain of citizen protection and that every lawmaker can justify the funding of a training program which improves the citizen protection by training fire service personnel.

In light of the comments above, it can be seen that I do not feel that the continued funding of FEMA as a whole is the best answer for the Federal budget or the fire service. I feel the organization must be restructured to achieve the most benefit from the dollar spent. The National Fire Academy should rate high on the list of spending priorities based on its own merit. I urge all of those who review the budget to make your decisions based on the best interest of the safety and welfare of the citizens. I feel that it will become obvious during these and other hearings, that the National Fire Academy does benefit every citizen who has a need for emergency services and is deserving of the continued funding. As budget cuts are made, it must be kept in mind that the "civil defense" is a second line approach and that as long as the fire service must justify its existence in an organization headed by retired Generals, the battle is uphill and the only losers are the citizens.

Another area of concern for fire service personnel is the support of the local fire programs by Federal revenue sharing and other Federal programs. It is obvious that in almost any emergency services system, the financial support of the local governmental agency is paramount to the continued existence of the emergency services system. Although I do feel that this financial responsibility should be borne local governmental level, it would appear that the continued reduction of Federal funds to local jurisdictions would further curtail the ability of these jurisdictions to adequately fund public safety programs. The Frederick county system can be shown as an example of the need for governmental support. It has been proven most cost effective for Frederick county to operate with a predominately volunteer system with a few full time paid personnel in the Frederick city area. Even with this volunteer system, the financial support of both city and county governmental agencies is essential. The work load on the volunteer is such that fund raising is becoming an ever increasingly more difficult task. I believe that a close examination of fire service programs throughout the country would show the same effect. It would seem that the most effective approach to maintaining the Federal assistance to the local fire and emergency services programs would be to continue to provide revenue sharing or other funding program with certain percentages or dollars earmarked for public safety. This would also provide an opportunity to insure the equal protection of all citizens. The funds could be audited to assure that the systems funded were providing protection to everyone in the closest response area and not governed by political boundaries or special district lines. Training of personnel and adequate equipment standards are also areas which could be addressed in the funding program. Although I feel that money with "strings attached" is sometimes more useless than no money at all, I think that it would be justified for the Federal government to assure that funds allocated for public safety were being spent to the best benefit for all. With a control system and expenditures to the local governmental units for the common good, it would seem that the continued spending levels could be amply justified.

The last area which I will address in this testimony is the overall picture of the fire service in relation to the Federal programs and focus. We must recognize that there is indeed a fire problem in the United STates. Whether we choose to address the problem on the local or National level the problem must be addressed. I feel that the Federal role is to continue to focus on this fire problem and continue to bring to light new technologies and methods of preventing and combatting fire. The Center for Fire Research has shown a tremendous impact on the knowledge base available in the science of fighting fire. Programs such as this can only be effective on the Federal level so that all may benefit from the knowledge gained. National seminars such as the National Fire and Burn Safety Symposium should be revived by the Federal system as they are a major benefit in bringing innovations and ideas from all across the nation to a single point to provide a tremendous vehicle for dissemination of information. Again, programs such as these can only be effective on the Federal level. The continued support of and the creation of additional National data banks for fire safety information is critical to the continued success of the fire programs throughout the United States. National programs to support smoke detectors and residential sprinklers would save many lives across the nation. The Federal support of these life saving technologies would be a major benefit to all citizens throughout the nation. This again can only reach everyone with an effective and well coordinated National program. The Federal government must realize that public protection from accident and fire is a major concern to be addressed. There is a fire problem which must be addressed. We should not allow the safety of the citizens take a back seat to any other programs. We have the abilities and technologies to make the United Stated more fire safe. We must realize the importance of these programs at election time and budget time and continue to provide the public protection which can be the best in the world.

In conclusion, I would like to point out the public safety is one of the major problems facing the legislators of today. There are problems in the current systems and the further reduction of funds to the local level operating units and to the National fire programs could have a profound and noticeable effect on the ability to protect our citizens. It should be remembered that protection from fire and accident is only evident when it is not provided. It would be foolish to lose the progress made to this point with the loss of funding and programs. Let's put the focus on the fire safety programs and justify these programs on their own merit. I am sure we will find the public support and every person who deals with or votes on the Federal budget can sleep better at night knowing that the best has been done to provide protection for themselves and everyone across the United States.

Thank you for the opportunity to present this information and a look forward to other chances to present information to support the fire programs and the operation of the emergency services for our county and for all.

Senator **Sarbanes**. Well, thank you very much.

Let me ask this question. When the programs were put into place, one of the points, and I want to particularly get your perspective from the State and local level, was that it was important that the Federal effort was to supplement and not supplant the State and local effort.

In other words, this was all to be, as it were, complementary to what State and local governments were doing and the main responsibility for firefighting and prevention was to stay at those levels.

Has it worked that way, as you see it, over the years? Have you been satisfied with the working relationships, or have you perceived any problems in it?

Mr. **Gabriele**. I think that relationship has been a good relationship and I think that's what was intended when that committee was put together back in 1973 or 1974.

What we're seeing at the State level is that the State government is now beginning to contribute even more moneys to the local fire services and in our office particularly, we're beginning to see some extra funding for various programs on the State level.

That's where it's supposed to be. We're supposed to take care of the day-to-day fire prevention programs and what have you. But there are many, many programs and, for example, there's a program right now, the National Community Volunteer Fire Prevention Program, that is a federally funded program. It's a unique program. It's unique because it's not being headed up by the fire service; it's headed up by a community service. In this case right here in Frederick County, for example, the Soroptomists are putting together a fire prevention program with the help of Federal dollars directed toward the elderly. Those are the kinds of things that we're needing from the Federal Government, those ideas that are generated as a result of the minds that are put together at FEMA and the U.S. Fire Administration.

I don't believe we can spend the time trying to generate those kinds of ideas. We have the problems of doing the day-to-day fire prevention programs. And many of us, for example, in our case on the State level, are hindered simply by the amount of dollars that are invested and by the amount of people that are invested in that kind of effort.

Senator **Sarbanes**. Chief, do you have anything?

Mr. **Frazier**. I would like to say when the first money started coming into Baltimore back around 1973, we went out and updated our fleet, which dated back into the 1940's, some of the rigs that were running around the city. We were able to buy 26 pumpers and 6 ladder trucks and have them on the street in less than a year.

If you look at the life of those units, it's projected at 15 years. Just 2 or 3 years down the road, we're faced with another problem. But we were able to upgrade our fleet instantly and it was strictly through this program.

Senator **Sarbanes**. Mr. Droneburg.

Mr. **Droneburg**. I can only echo what Mr. Gabriele said. I think we do have a good working relationship as we move from State to the local government level. Of course, at each lower level of government, we're more concerned with operating and with the protection of the people in the street, so to speak.

But the funding of the programs, the national programs which the local people participate in, as well as the funding of local programs, has worked very well and has allowed the fire service in the local areas, and speaking specifically for this area, to advance and to work closely with the county government and the local government units to do things that would not be available without the Federal support.

Senator **Sarbanes**. Well, let me just pick up on that last point and ask all three of you, the people who wield the pencils at OMB sort of assert that if the Federal Government receded from this area and the things that it's been doing under these various programs with the Fire Administration and the Fire Academy and the Center for Fire Research, that the State and local governments would move in and pick it up.

I'd like to ask you whether you see any prospect that that would happen from two points of view—first, just from the dollar and cents, from the money point of view, in other words, where's that money going to come from; and second, and perhaps even more importantly, how's it going to be put together?

In other words, the Federal role in this is effective, as I perceive it, as sort of a catalyst and a coordinator. It can sort of plan things, work out all the cooperative effort, institute the program. And a lot of it is actually then carried out by the State and local people. But if the Federal Government pulls out of it, who's going to move in to be the catalyst to pull it all together and to coordinate it and to, in effect, make it work?

And I'd appreciate it if you would address that point.

Mr. **Gabriele**. I think the easiest part, to answer your question, is the dollar part. I would find it very difficult, for example, for the State of Maryland government to come up with the amount of money that's being cut out of the Federal budget that's expended toward State and local government.

And I could speak as a State fire marshal in a budget in the department of public safety where we're one of the smallest agencies in that department. I find it very difficult to justify just a few thousand dollars. I don't know how we would be able to justify, for example, the loss of dollars in the millions across the State of Maryland.

As far as who would coordinate the activities across the State, I don't know. One of the problems, obviously, in the fire service is the parochialism of fire service, no different, obviously, than law enforcement was years ago, but still going through that problem right now. And maybe that should be so. The parochialism works very well. Many of the larger services have their own training academies. They have much of their own services that they provide for their local government. And I don't know that there's a State agency together, including the fire marshal's office right now, that could pool together and coordinate all of those programs.

I think that's probably the major role that's being accomplished by Federal involvement. And I think that's the thing we have to get across to the Congress, that they must continue their role. They must support the State and local governments, not only with their money, but with the fact that they're there to pull this group together and make it a cohesive effort.

Senator Sarbanes. Did any of the others have a comment on that?

Mr. Frazier. I think, Senator, back when the committee got together after the civil disturbance in 1968 and then you came out with "America Burning," you had a shocking number in there of over 12,000 people dying in fires in the United States. And I think since your report, we've cut that in half throughout the United States.

So I see a lot of good coming out by the coordination of the Federal Government into the State and local governments in coordinating this program.

Senator Sarbanes. Yes, Mr. Droneburg.

Mr. Droneburg. I can only also say, in fact, to the Fire Academy and to your question on coordination, there is still a tremendous need for a national focus for fire training as well as for fire education. The information that's gained by the people coming together from across the United States in these types of programs could not be supplanted by State and local programs because you would not have that national interaction, that national knowledge base that you would have now with the Federal coordinated programs.

Senator Sarbanes. That's a good point. I want to pursue it, because some who are trying to cut these budgets assert that we don't need to bring people together at the Fire Academy for training programs, that they could stay in their own localities and that training could be done simply through correspondence or through a local training program there.

What's your reaction to that and how much do you think you would lose by the fact that they weren't interacting with people from other fire services and other parts of the country in gaining the perspective—plus, I guess you don't get the same concentrated focus that you would have.

Mr. Frazier. Mr. Chairman, I'd like to respond to that by saying that members of the Baltimore City Fire Department that have taken advantage of coming up here to the National Fire Academy, including myself, I think one of the greatest lessons we learned was the exchange of ideas by talking to other fire officials from around this country who got together.

You can read a book or write a letter, but to sit down and talk one on one and exchange ideas has been very valuable to the fire service.

Mr. Gabriele. I think what will happen, Senator, if the National Fire Academy is allowed to go by the wayside is that we will see true parochialism. You'll see the inbreeding in training, what have you, within the various departments and they'll get that very narrow focus that they would not have if they were given the opportunity to continue to go to the National Fire Academy and to meet and talk and discuss issues that are occurring all over the United States

I had the opportunity to attend the executive development course at the National Fire Academy. The discussions that went on were far beyond the academic routine of the day. After the hours, many discussions took place that were a learning experience, one that I would not have received had I not had the opportunity to meet with fire service personnel from all over the United States.

Senator **Sarbanes**. Yes, because otherwise you're exchanging perspectives with the people you exchange perspectives with anyhow.

Mr. **Gabriele**. Every day, that's right.

Senator **Sarbanes**. Yes. Let me ask you this question.

It's easy to look at the budget and the dollars that this program costs; it's more difficult to put a dollar figure on the achievements of the programs, in reducing the loss of life, which I think has been very impressive, actually, over this period of time. We've gone from, what, about 10,000 deaths nationwide to 6,000?

Mr. **Frazier**. About 12,500, and we cut that in half since the report came out.

Senator **Sarbanes**. From 12,000 to 6,000. And there is also the reduction in property damage loss. How do we make people understand that but for these programs, the property loss would be much higher than it is?

Wouldn't you say that what we've achieved many, many, many times outweighs the amount of money that's been spent in order to achieve it?

Mr. **Frazier**. What price human life?

Senator **Sarbanes**. Yes.

Mr. **Gabriele**. I think that as long as we are experiencing the loss of lives and the great loss of property that we're having today, we need the Federal support that we're getting today and we need the National Fire Academy. We need the Center for Fire Research. We need the National Bureau of Standards.

It's an effort where everyone has to participate so that we can accomplish what it is that we're trying to accomplish; that is, cut down to the minimum the number of deaths that occur across these United States. Knowing, for example, that we're not going to be able to cut down every fire death as long as we have those of us who are human beings, men, women, and children, in this country, there are bound to be fires.

All we're trying to do is get it down to some reasonable area where we can say, well, maybe that's acceptable.

Japan, with the number of people and the population they have, have one of the lowest fire death rates in the world. Why? Because of the programs that they have put together over there and the enforcement of those programs.

We're not ready to accept that kind of stringent enforcement in this country, but I think that we should be going in that direction.

Senator **Sarbanes**. So do you have any observations on the question of emphasizing fire prevention, as opposed to emphasizing fire suppression?

Mr. **Gabriele**. Well, maybe I ought to let Chief Frazier talk about that, but just let me make a comment.

I think, historically——

Senator **Sarbanes**. Is that sort of a phony argument?

Mr. **Gabriele**. Well, I think, historically, the fire suppression forces of this country have been there—the fire services have been there to suppress fires, to put out fires. That goes back to God knows when.

But what is difficult to do is to change the mindset of fire suppression to a fire prevention program and our firefighters across the State of Maryland. I may be totally wrong in that perception, but I think that that's one of the problems that we have in the fire service—not necessarily a problem, but it's one of those issues that has to be addressed.

Fire prevention, like crime prevention, like any other kind of prevention, is very difficult to put dollar signs to—what have you stopped by going into a good fire prevention program?—it's also difficult to get across to those people who have been in the profession for years and years that maybe we ought to look at another way of handling the fire issues in this country.

I'm not sure that's going to fit well with the fire service people who are here today, but I think that's an observation that I would make.

Senator SARBANES. Chief.

Mr. FRAZIER. Yes. Our whole philosophy has changed, I think since I joined the department, where we had prevention people and we had medical people and we had suppression people.

We have geared our fire department, using the maximum out of all of our resources, and we have our suppression people now heavily involved in prefire planning of buildings, fire prevention inspections, as well as in the first responder in the medical field. We have changed the philosophy. We have made them part of the whole fire department. Instead of having 20 specialists out here to serve 90 square miles and 750,000 people, we have involved the whole department.

We feel that it has not been a problem with the younger people coming in, they come in with the change and they grow with it. The older fellows have accepted it.

That's how we're doing the job. We're just not dependent on about 20 fire specialists. We have trained our people in arson. We've trained them in going out and doing fire education programs to the community groups.

It's a total involvement of the fire service. You just don't wear the helmet of the guy charging in on the fire scene any more.

Senator SARBANES. Right.

Mr. DRONEBURG. What the chief illustrated in the metropolitan area is really working the same in the rural areas and in other areas that we see around here. The fire departments are evolving and changing. There's not really the dichotomy between prevention and suppression.

The protection of lives has become an overall job. So the firefighter has to be aware of residential sprinkler systems to support those programs, as well as has to continue suppression activities when the systems are not in effect.

It's obvious that the prevention is not going to do away with the fire service, not going to do away with the suppression end of the fire service. But it is the area that we are trying to emphasize now is the best fire, of course, is one that doesn't start.

So I think the whole fire service is moving toward that end and moving in a very coordinated fashion, as long as there are programs available that allow us to do that throughout the United

States and with the impetus of the Federal funding and the Federal programs.

Senator **Sarbanes**. The Federal Emergency Management Agency has had some administrative problems, to put it kindly, and some abuses, which have kept that top administrative structure in some turmoil. It's been reflected, to some extent, I think, in the Fire Administration and in the Fire Academy. You have a lot of turnover, and so forth.

I really want to ask you a pretty pointed question—how much has that impeded the effectiveness of the programs, as you see it from your perspective?

Mr. **Gabriele**. I would suspect that it's impeded the program simply because they've lost the confidence of the Congress, if nothing else. I'm hoping that General Becton, who is the new administrator, will be able to pull things together and get the programs on the road again.

It's a sad commentary when you have those things happen to those people that high up in the administration and, unfortunately, it all flows downhill.

There are many, many excellent people in the Federal Emergency Management Agency. It's unfortunate that a few people had to go the way they did because it has hurt the Federal support that the State is getting, the States and local governments, are getting, simply because that support has been lost in the Congress because they don't have the confidence in the people that are there today.

I'm hoping, and I think we're seeing that now, that General Becton will come in, pull the forces together, and begin to build the confidence in the Congress in the fire service in the United States.

Senator **Sarbanes**. I just want to make an observation. I think it partly reflects the failure to take this whole effort seriously enough. In other words, if you were talking about the Department of Defense and an important position involving the security of the Nation, you'd make sure that whoever held that position was highly competent and committed.

I happen to think that this effort is of great importance. It's one I have followed closely and been involved in for many years. When we responded to this report, "America Burning," which I think is one of the really find documents ever produced by a commission in this country, we were facing a situation of 12,000 deaths a year, little attention paid to firefighters and how to protect them, give them better equipment, better protective gear, we did not have the kind of fire education safety programs we have now, not the new techniques like the automatic sprinkler. These have had a tremendous impact.

We seem to get inured to this thing. If we had a tragedy that killed 6,000 people all at once, the country would be in a turmoil over it. Yet that's what happens each year, but we don't pull it together to develop the techniques to address it. We want to keep pressing this.

You've been a very helpful panel. We appreciate your testimony very much.

Mr. **Gabriele**. Senator, thank you very much.

Mr. **Droneburg**. Thank you, sir.

Senator **Sarbanes**. We'll go on to our second panel, the representatives of the fire service organizations.

Lt. Col. Ward Caddington is here from the Prince Georges County Fire Department and the International Association of Fire Chiefs, I gather.

Mr. Gerard, Washington representative of the National Fire Protection Association.

Is Mr. Rouse here?

Mr. **Caddington**. I don't believe so, Senator.

Senator **Sarbanes**. No.

Mr. **Caddington**. I don't believe he's here.

Senator **Sarbanes**. Okay. Clarence Carpenter, the president of the Maryland State Firemen's Association.

And Sgt. Romeo Spaulding, the national legislative liaison of the International Association of Black Professional Fire Fighters.

Colonel Caddington, why don't you start off.

STATEMENT OF LT. COL. WARD W. CADDINGTON, SPECIAL OPERATIONS, PRINCE GEORGES COUNTY FIRE DEPARTMENT, ON BEHALF OF CHIEF M.H. "JIM" ESTEPP, PRINCE GEORGES COUNTY FIRE DEPARTMENT AND THE INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

Mr. **Caddington**. Okay, Senator. Good morning. Chief Estepp sends his regrets for being unable to attend this morning.

Mr. Chairman, I want to take this opportunity to thank you for inviting me as a representative of the International Association of Fire Chiefs to testify on this matter of vital importance, not only to the American fire service, but to the citizens of this country threatened by fire, medical emergencies, and other hazards requiring emergency response.

Mr. Chairman and members of the subcommittee, the International Association of Fire Chiefs, representing this nation's chief fire officers, is here to speak for those fire chiefs who are charged with managing and administering the fire departments that are our Nation's first line of defense against fires, medical emergencies, floods, earthquakes, hazardous material emergencies, and an endless number of manmade and natural disasters.

In other words, our members are charged with protecting the public.

Therefore, I appear before this subcommittee today to defend those Federal programs that help our members do a more effective job of protecting the public.

What do you think would be the reaction if every month one fully loaded 747 took off from Washington, DC, and another took off from Los Angeles and they collided somewhere over the Midwest, killing everyone aboard both planes. The official and public outcry would be deafening. The attention given this problem would fill newspapers and television screens across the country. Yet, that is approximately how many people we kill in fires every month in this country, and the outcry is far from deafening.

Before this hearing is over, another three people will die in fires because fires kill approximately one person an hour. Unfortunately, most of those killed will be over 65 or under 10 years of age.

The human suffering and loss from fire is tragic. However, the economic loss is staggering. The overall annual loss from arson alone is in excess of $4 billion. From fires in general, the loss is in the tens of billions of dollars. The point that we will try to make this morning is that with a modest amount of seed money—the $25 million devoted to the Federal fire programs—those programs over the last several years have reversed the national trend and have caused the decline in this country's human and financial fire loss statistics.

Any reduction or cutoff of Federal support would cause a direct negative effect on current improving trends in the area of fire prevention and safety. It would be disastrous to have worthwhile programs that are providing effective public safety fall under the budget cut ax.

Since the Federal fire programs were started in the mid-1970's, we can register the following successes primarily resulting from stimulus provided by the U.S. Fire Administration and the National Fire Academy:

Since the USFA and NFA programs have been in operation, life and property loss from fire has turned downward. In a 6-year period, deaths are down to 6,000 annually from a high of almost 8,000.

As a result of USFA public education programs and leadership, smoke detectors have been installed in more than 60 percent of this nation's homes.

The USFA's National Fire Incident Reporting System was established and now links more than 11,000 fire departments in 39 States. This information exchange network is invaluable both as a gauge of the fire problem and our success in combating it. It can be managed effectively only at the Federal level.

The USFA has developed one of the world's most effective resources for fighting arson. This includes juvenile firesetter programs, arson early warning systems, an arson information management system and development support for local antiarson activities.

Statistics now show that total incendiary and suspicious structure fires are down 35 percent from a peak in 1977. Civilian deaths in these same fires are down 24 percent from the peak in 1977.

The U.S. Fire Administration has taken the lead in developing a number of important firefighter health and safety programs, including Project FIRES, the purpose of which is to design new, state-of-the-art protective clothing for firefighters. It is important to point out that Project FIRES did not reinvent the wheel, but took proven "spinoff" technology from NASA's space program and adapted it to the fire service. Project FIRES also has involved the private sector in developing materials for the protective clothing.

The U.S. Fire Administration is a much-needed clearinghouse of fire information. It has played a leading role in disseminating information on fire prevention, the use of smoke detectors and sprinkler systems and a five-step planning process for public fire safety education program managers.

The U.S. Fire Administration has made a special effort to reach out to children—the frequent victims of deadly fires. In fact, children under 5 account for 17 percent of all fire deaths. This effort has included the successful production of the Sesame Street preschool fire awareness program.

The National Fire Academy serves as an advanced training facility for the American fire service at all levels of government. The National Fire Academy has played a major role in standardizing the use of proven fire protection programs and grooming the professional men and women called upon to use them.

Recent years have seen a marked increase in public concern over toxic chemical accidents. In communities across the country, it is nearly always the fire service that must respond when these accidents occur. The National Fire Academy is the only Federal training facility, and I emphasize, the only Federal training facility, with a clear mandate to give hazardous material training to local-level emergency response personnel.

In a recent IAFC survey, more than half of the public fire departments that responded said that they received their outside training from the National Fire Academy. The elimination of the academy's student stipends will eliminate the primary affordable source of hazardous materials training available to the fire service. It also will mean that the emergency response personnel expected to handle hazardous materials accidents will not have anywhere to go to get this vital training.

The fire community worked for more than a decade to convince Congress of the need for a Federal focus on fire, particularly fire prevention. The justification for these programs, the U.S. Fire Administration and the National Fire Academy has not changed.

Although I realize that it is the subject of another hearing, I would like to say a word in defense of the Center for Fire Research at the National Bureau of Standards.

The center is an internationally respected scientific research facility. The elimination of the center would destroy the only Federal scientific body that has aggressively researched and analyzed the chemistry and physics of fire. This pioneering effort has led to a fundamental understanding of the nature of combustion and the development of fire-resistant materials and building techniques.

It is also worth pointing out that the Center for Fire Research was primarily responsible for developing the technology that led to the smoke detector and the quick response sprinkler—two technologies that the fire administration is using to promote improved fire safety across the country. This is a good example of the flow of technology and information from the center to the fire administration to the public.

Finally, elimination of the Center for Fire Research would leave the United States as the only industrialized nation without a central Federal fire research facility, an embarrassment in light of the fact that the United States has one of the highest fire death rates of any of the industrialized nations.

We realize the need for a balanced Federal budget and the absolute necessity to reduce our sizable Federal deficits, and we realize that there will be some changes as a result. However, we also realize that Federal involvement is needed:

To continue the essential downward trend in fire deaths and injuries;

To continue the reduction in property loss from fire;

To have a sound fire prevention program across the country;
To educate fire officers in all aspects of fire protection;
To continue fire research programs;
To maintain and improve the national fire data systems; and
To promote to the fullest extent automatic detections, alarm and suppression systems.

Federal funding for fire prevention programs is extremely cost effective. Few Federal programs can boast as many accomplishments with a total budget of less than $25 million a year.

The $25 million needed to fund Federal fire programs is an insignificant amount compared to the $312 billion requested for defense programs in the fiscal 1987 budget. In fact, it would cost the taxpayers $10 million less to fund all Federal fire programs than to purchase one F-18 fighter aircraft.

Twenty-five million dollars, and the prospects are good we can continue the downward trend in the terms of billions of dollars we lose in this country every year from fire.

How can we measure the value to our society of those who are still alive because of these programs? Statistically, it is likely that someone in this room or a family member of someone in this room right now might number among the almost 10,000 lives saved over the last 5 years. Funding for these programs is more than dollars; it is a statement and commitment on the part of the whole country that fire is a problem with which we must deal.

I have attached a detailed list of the U.S. Fire Administration's major accomplishments from fiscal year 1983 through fiscal year 1985. If you have no objection, I would like to have that list included as a part of the official record.

Senator SARBANES. It will be. It's very helpful.

Mr. CADDINGTON. Thank you for the opportunity to testify.

[The information referred to follows:]

U.S. FIRE ADMINISTRATION

MAJOR ACCOMPLISHMENTS: FY 83-85

Reorganization Matters

- Completed transition to NETC/TFPD (FY 83-84)
  - New organizational plan approved by Director
  - Consolidated in new offices in "N" Building
  - Recruited staff for 20 FTE
- Established new working relationships with National Fire Academy and Emergency Management Institute (FY 83-84)
- Developed new program priorities in consultation with Joint Council of Fire Service Organizations (FY 83)
- Completed several carry-over FY 82 projects (FY 83)
- Completed 100% funding of program plan despite transition period (FY 83)

Program Accomplishments

Estimated Funds Expended

I. **Policy and Coordination** (Fire & Rescue Service Mgmt)

- **New Program Planning**

  Initiated planning for several new programs, i.e. National Community Volunteer Fire Prevention, national residential sprinkler, and private sector participation programs.

  (FY 83-85) 175 k

- **Integrated Emergency Management**

  Developed and funded with support from FEMA/SLPS a major Integrated Emergency Management System (IEMS) project with the International Association of Fire Chiefs (IAFC). This effort, started in FY 83, has developed and promoted improvements in emergency management planning and operations from the fire and public safety perspective. Promoted and monitored by a national advisory committee, this project has produced many important products including 15 regional IEMS workshops; varieties of information through a clearinghouse, Fire Chief Magazine, and other publications; a planning guide for community leaders; and an IEMS workshop kit; and also provides analysis and input into SLPS programs in data collection and use, continuity of government and emergency support services.

(FY 83-85) 300 k

o Fire Executive Fellowship Program

Established the FEMA Fire Executive Fellowship Program at Harvard University in cooperation with the JFK School of Government and the National Fire Academy (NFA). A national competition is used to select senior fire executives to attend a three-week program at Harvard. Sixteen Fellows have been selected over three years. This program is now incorporated into the master curriculum of the NFA.

(FY 83-85) 125 k

o National Leadership Conferences

With support from the National Fire Academy, carried out several national leadership conferences. One, the "Partnerships Against Fire" attracts fire officials, educators, community groups and others. Another conference brought the 50 State Fire Marshals together in cooperation with the Fire Marshals Association to focus on the unique and changing issues facing states.

(FY 83-85) 275 k

o Volunteer Fire Service Communications

In cooperation with the National Volunteer Fire Council, supported effort to improve information network among nation's volunteers. Also supported Stonebridge planning conference with NFA.

(FY 83-85) 60 k

o Consensus Codes Program

In fulfillment of mandates of PL 93-498, supported the ongoing consensus codes process of the National Fire Protection Association (NFPA). The promulgation and adoption of improved codes will lead directly to a further decline of the loss of life and property due to fire.

(FY 83-85) 875 k

- Alternative Fire Service Methods & Management

  Assessment of the various methods that local governments are using to provide fire protection and other fire prevention. Information shared with state and local fire services including manuals, other publications and materials.

  (FY 83-85) 60 k

- FEMA Regional Support

  Provision of funds to Regions to support regional fire information centers.

  (FY 83-85) 45 k

- Basic Fire Research (CFR)

  Reinstituted joint research projects with NBS/Center for Fire Research (CFR) supported by USFA funds. These projects involve basic testing, modeling and analysis on subjects such as smoke detectors, extension of use of residential sprinkler technology, fire safety, trade-offs and cost/benefit analysis of firefighting protective equipment.

  (FY 85) 300 k

- Fire Safe Cigarette Research (CPSC)

  USFA Administrator appointed as Vice-Chair of Interagency Committee established by Cigarette Safety Act of 1984. Technical Advisory Committee (15) representing public health, fire safety, furniture and tobacco industries oversees the research activities of this program.

  (FY 85) 150 k

II. Firefighter Health and Safety

- Project FIRES (Firefighters Integrated Response Equipment System)

  During the past three years, the Fire Administration has been involved in a program to improve the design and performance of structural firefighters protective clothing and equipment. This project has produced and field tested three versions of prototypes aimed at lowering the metabolic load of firefighting without sacrificing protection. Prototypes have been field tested in 14 cities. The next version of NFPA 1971 (standard on protective clothing for structural firefighting) will reflect the research findings of project FIRES.

(FY 83-85) 370 k

- Firefighting Equipment

  The United States Fire Administration has been active in the development and testing of tools and equipment for firefighting. Two of the units which are being developed are a short-range radio for fireground communication and an oxyen rebreather breathing apparatus for special incidents. These units have reached the prototype stage and are currently in field testing.

  (FY 83-85) 300 k

- Standards Making Activities

  The U.S. Fire Administration has been active on the committees that set standards for sprinkler systems and for firefighter proteciton. This has included work with the National Fire Protection Association and the American Society for Testing and Materials.

  (FY 83-85) 2 k

- Stress Management and Model Program for Firefighter Physical Fitness

  Developed the framework for a program to address both firefighter physical fitness and stress management. The physical fitness program will be for firefighters who require extensive work to pass the initial physical fitness performance examination. The stress management effort is for reducing stress affecting the fire service in today's environment.

  (FY 85) 210 k

- Apprenticeship Program

  In cooperation with the International Association of Fire Chiefs (IAFF), the USFA has supported the program to develop, promote and implement apprenticeship training for firefighters and emergency medical technicians. This program serves to standardize the training received by departments throughout the country.

  (FY 83-85) 1.5 Mil

- Northwest Firefighter Mortality Study

  The University of Washington Harborview Medical Center is conducting a mortality study of firefighters in the City of Seattle, Washington. This study looks at all causes of deaths that may be associated with changes in fire smoke exposure in recent decades.

  (FY 85) 82 k

- Smoke Detector Effectiveness

  Single station smoke detectors have been in general usage for ten years. To determine smoke detectors long-term effectiveness, the USFA conducted a study of public education, proper installation, maintenance, and reliability of smoke detector components.

  (FY 83) 30 k

- Smoke Inhalation Study

  The USFA has contracted with the American College of Emergency Physicians to develop a diagnosis and treatment protocol for victims of smoke inhalation. This project is nearing completion (June 1986) and the results will be disseminated to the medical community.

  (FY 83) 76 k

- Fire Department Safety Officer's Reference Guide

  The Fire Administration funded the Fire Department Safety Officer's Reference Guide. The work was performed by the National Fire Protection Association (NFPA) and it will be made available through (published by) the NFPA.

  (FY 83-85) 29 k

- Protective Clothing

  The Fire Administration is actively working with the American Society for Testing and Materials (ASTM) F-23 Committee on Protective Clothing to develop standards for chemical protective clothing for use by the fire service. This is a continuing 1984 initiative and complements USFA's participation on the newly formed National Fire Protection Association (NFPA) 1971 Subcommittee on Hazardous Materials Protective Clothing.

  (FY 85)

III. Fire Prevention and Arson Control

o Community-Based Anti-Arson Program

Developed and funded through competitive grants to various community organizations. Over 30 grants provided to create neighborhood based anti-arson programs to mitigate arson related fires.
(FY 84-85) 570 k

o Community Volunteer Fire Prevention

Congressionally mandated effort to increase the scope and effectiveness of local fire prevention through a merger of federal, state and local resources with the private sector to support new community prevention, education and protection programs. Grants awarded to States (20 and DC to date) who in turn fund local projects (61 projects currently).
(FY 84-85) 3 Mil

o Residential Sprinkler Program

Application of quick response sprinkler technology offers a means to dramatically reduce loss of life and destruction to property. Since 1974, USFA has spent considerable resources to develop quick response sprinkler heads. With a significant increase in funds from Congress in FY 85, the USFA has been able to extend the application of this technology through additional research, demonstration and information dissemination. Examples are:

- Research: unique occupancies, cost-benefit analysis, and local fire tests (San Francisco, CA and Lisle, IL)

- Demonstrations: Regional and local fire demonstrations, retrofit demonstrations in high risk occupancies and continuation of retrofitted mobile trailers (20).

- Info dissemination and technical assistance: Local documentation and publication, printed materials, "Ounce of Prevention," Regional workshops, national conference, and technical assistance (Operation Life Safety).

(FY 83-85) ~2 Mil

- Juvenile Firesetter Program

  Sesame Street and the Childrens Television Workshop, in conjunction with other youth projects, has resulted in development of guides for juvenile counseling to be used by local fire services and schools as well as by the NFA in its field programs.

  (FY 83-85) 300 k

- Arson Information Management System

  Designed to run on the various microcomputers used by the fire service today, the USFA has developed and refined this technical program for case management use at the local level to identify potential arson.

  (FY 83-85) 130 k

- Arson Research and Development

  A variety of efforts are supported by USFA to identify and mitigate the worst effects of arson. These R&D efforts include the study of rural arson, support of the federal arson task force, and development of a model urban arson strike force.

  (FY 83-85) 150 k

- Arson Education and Resource Projects

  Continued support of the Arson Resource Center, housed at the Learning Resource Center/NETC; information provision through the ABA, and the production of several arson and education directives provides the USFA with several methods for continuing to provide information to the fire services and related groups.

  (FY 83-85) 200 k

- Teleconferences

  In conjunction with FEMA, USFA has funded and provided program management for a number of national teleconferences in arson, residential sprinklers and hazardous materials.

  (FY 84-85) 200 k

- Codes Administration Project

  Developed and funded project to produce a computer-assisted, reality-based codes training program for local administrators and fire service officials.

  (FY 83-85) 100 k

- Public Education and Awareness

  Responding to Congressional interest in expanded public education and awareness, USFA is carrying out a broad-based program in support of all USFA programs. In addition, targeted education programs are being carried out starting with two efforts aimed at smoke detector maintenance and community volunteer fire prevention activities.

  (FY 85) 1.1 Mil

IV. Fire Data and Analysis

- National Fire Incident Reporting System (NFIRS)

  With the cooperation and support from the National Fire Information Council (NFIC), the USFA operates the NFIRS program. Program collects accurate fire data from throughout the U.S. with 38 states and 20 metro areas reporting on a voluntary basis.

  (FY 83-85) 800 k

- Data Analysis Support

  Manage a comprehensive program of data collection and analyses on issues and incidents relating to fire in response to requirement of P.L. 93-498. Publications and reports, such as *Fire in the U.S.*, are disseminated to interested groups and the public at large.

  (FY 83-85) 600 k

- Management Applications Project

  Improvement of both long- and short-range planning and tactical decisions of fire executives through the development, testing and adoption of automated management information systems. Pilot sites (Arlington, VA; Prince William County, VA; and Southfield, Michigan) are testing the data systems and additional sites will replicate the data packages. Flexible and adoptable automated data systems will be available to other fire departments.

  (FY 83-85) 800 k

- Major Fires Analysis

  In conjunction with support from the NBS/Center for Fire Research, the USFA investigates and analyzes selected fires of special significance. Reports are developed for publication by national fire journals and for use by NFA in resident program.

  (FY 83-85) 300 k

- Special Studies and Reports

  Completion of special studies and reports on current issues facing the fire and rescue service. Examples are a lecture video series with NFPA, alternate heating studies, State-by-State analysis for Community Volunteer Program, firefighter health and injury surveys, public service announcements, and others.

  (FY 83-85) 425 k

Senator **Sarbanes**. Thank you for some very helpful testimony. Mr. Gerard, please proceed.

STATEMENT OF JOHN C. GERARD, WASHINGTON REPRESENTATIVE, NATIONAL FIRE PROTECTION ASSOCIATION

Mr. **Gerard**. Thank you, Senator.

I want to thank you for the opportunity to be here this morning and congratulate you for seeing that the fire programs really are an investment. I think it's appropriate that the subcommittee is looking at the money spent on fire programs because it truly is an investment.

The National Fire Protection Association is a nonprofit, technical, and educational organization. We were founded in 1896 and from our inception, we've prided ourselves on being the principal public advocate for fire safety in the United States.

Our membership is drawn from all the disciplines that are involved in, and concerned about, fire safety. We're not a trade or an industry association. The one common denominator in our membership is a concern for fire safety.

Our members include the fire service personnel, fire marshals, electrical inspectors, city managers, architects, engineers, educators, groups from commerce, industry, insurance, Federal, State, local government, in fact, everyone who has a concern about fire safety.

You've asked us this morning to address the economic and the social costs of reductions in Federal support for fire protection, as well as our view of the appropriate Federal role in this area. Let me first address the economic and social costs.

While the picture has improved, and I think you outlined that quite well at the beginning of this hearing, the American people, as each one of us will say, I suppose, as we come before the microphone, we still destroy nearly $7 billion in property, snuff out 6,000 lives and injure over 30,000 people every single year as a result of fire.

Trying to reduce those losses even further continues to be one of the major goals of the NFPA. Since the formation of the U.S. Fire Administration, we've worked with the Federal focus as a partner, trying to improve fire and life safety for the American people.

We have as a part of our association mission collected and analyzed the data necessary to accurately identify the elements of the fire problem and we've developed materials and delivered programs leading toward the goal of reducing fire and life loss in the United States. We've been doing that since 1896. However, for the past 10 or 12 years, we've been helped enormously in that work by the U.S. Fire Administration.

Another key element in the Federal fire focus is the National Fire Academy. The National Fire Academy provides essential training for fire personnel, both career and volunteer. One severely threatened program element at the National Fire Academy is the stipend. The National Fire Academy has traditionally provided stipends to help defray the cost of attending courses there.

This is an essential element in their program. Many people don't keep in the front of their mind that 90 percent of the fire service in the United States is volunteer. For a volunteer to attend the National Fire Academy, he or she must take time away from work, to start with. They can't come as a paid attendee the way a career firefighter might. If that sacrifice is then multiplied by requiring the volunteer to pay for their transportation and full per diem while they're there, the sacrifice they make becomes prohibitive and the volunteer fire service especially begins to stagnate from lack of professional training and the American people once again pay a price that exceeds any savings that are made in the Federal budget.

The Center for Fire Research is another strong part of the fabric of the Federal fire focus. The center has done much creative and worthwhile research leading to direct benefits to the American people. Smoke detector improvements and quick response sprinklers are just two examples, and we saw how effectively both smoke detectors and the sprinkler worked in the trailer outside before this hearing began.

The U.S. Fire Administration, the National Fire Academy, the Center for Fire Research, they've all delivered cost-effective products of direct and immediate benefit to the American taxpayer—smoke detectors, quick-response sprinklers, improved firefighter protective equipment, support for community-based volunteer fire safety programs—the list is long and it is distinguished.

An investment here has always paid immediate dividends. These are not "growth stocks" with only a value in the future. Investments here are "income investments"—the return is immediate and their elimination would have an immediate and impoverishing effect on many programs.

The activities that are supported by the U.S. Fire Administration would be hard, if not impossible, to deliver if funded solely by nonprofit associations. You heard before that State and local government does not have the resources to pick up the whole program. And I can tell you that the private sector doesn't have the full resources to pick up the program, either.

I'm sure that all private sector organizations that work in this field would agree that the supplementary support from the U.S. Fire Administration, from the Federal Government, is an essential element in delivering and developing top quality programs. Without that support, the programs will languish and the recent improvements in fire and life safety will begin to erode at a significant cost in lives and dollars.

Regarding the appropriate Federal role in the area of fire protection, I think it's fair to note that from its inception, the NFPA has been concerned about the Federal involvement in this program, concern that there would be a loss of local or private sector influence and control in fire protection.

Fire protection is essentially a local issue. It's a generally accepted premise that the Federal Government should not assume the powers of State and local government and I think the State fire marshal from Maryland assured all of us that that is not occurring, and I think that's good.

It's equally unacceptable to compete with the private sector. For the past 10 years, we've seen the U.S. Fire Administration supplement, improve, and disseminate successful programs that are developed at the local level and in the private sector and to act as a catalyst to see that these programs expand and are delivered on a broader range.

There are joint, cooperative relationships established to foster and maintain a coordinated attack on the fire problem. Such partnerships are the cornerstone of an effective Federal role in fire protection. It's essential that Congress be watchful for creeping competition with local government and private sector programs, and I think Congress has done a good job of that up to now. Such competition, of course, merely duplicates that which already exists and at a considerable and unnecessary cost in Federal dollars.

The funding level necessary to maintain the Federal fire program is not a number that comes easily. The current funding level is probably a good starting point. You know, "America Burning" recommended a funding level at 10 times what it is now. So I think that the current funding level is a good place to start. But this should be enhanced by making a stronger commitment to providing Federal support for State-level fire incident reporting systems.

Now if we don't know what the fire problem is, we can't very well deal with it, the U.S. Fire Administration or anyone else. So knowing what the problem is is really essential to working the program. The data systems are State data systems. The data are collected at the State level and then merged together at the Federal level. But they're essentially State programs.

In addition, the National Fire Academy needs stipends to support participation in executive development programs for fire managers. If there's a key element that will improve fire safety in America, it's better fire chiefs. I've been a fire chief. I know that when I was in Los Angeles, our problem was not that the firefighters didn't know their job. Our problem was making fire chiefs better managers, a very, very critical element and that is the one thing that the National Fire Academy can do that nobody else can do, regardless of money.

You can give all the money in the world to State and local programs, but they cannot bring that group of people together from across the country to share information and to work together to see what other people are doing.

That, I don't really believe, is a money issue. It is something that is so critical, that it has to continue.

So to put it in one paragraph, the programs are good. They're cost effective. They're successful. They provide direct and immediate benefits for the American taxpayer and are unquestionably a proper and desirable expenditure of tax money.

I'd be happy to answer any questions. Mr. Chairman.

Senator SARBANES. Thank you very much. We'll complete the panel and then come back to questions directed to some or all of you.

Mr. Carpenter, please proceed.

STATEMENT OF CLARENCE D. CARPENTER, JR., PRESIDENT, MARYLAND STATE FIREMEN'S ASSOCIATION, ACCOMPANIED BY LEONARD KING, IMMEDIATE PAST PRESIDENT

Mr. CARPENTER. Thank you. Mr. Chairman, my name is Clarence Carpenter, president of the Maryland State Firemen's Association. With me is Leonard King, immediate past president of the association. We appear before you on behalf of the Maryland State Firemen's Association. We have a membership of some 340 companies with over 20,000 members in the State of Maryland.

We are appreciative of the opportunity to address this committee today because we believe that Congress has the responsibility to provide the funding necessary to maintain the U.S. Fire Administration, the Center for Fire Research at the National Bureau of Standards, and the National Fire Academy at Emmitsburg, Maryland.

In 1973, the report of the National Commission on Fire Prevention and Control, "America Burning," was published. Chapter 1 of this report is entitled "The National Fire Problem." We believe the life and property loss by destructive fire is a national problem, as well as a State and local problem.

In recent years, the allocation for the U.S. Fire Administration has been far short of the recommendations suggested in the report of "America Burning." There have been significant personnel cuts which have forced the Administration to move toward contractual arrangements for delivery of services.

We believe that these contractual arrangements have been detrimental to the overall effectiveness of the U.S. Fire Administration. Permanent staff people provide a better continuity of service and expertise.

Mr. Chairman, we urge your committee and Congress to support adequate funding so a strong permanent staff can be established, viable programs can be developed, and technical support and assistance can be provided on fire data, public fire safety, education, and fire prevention.

We also feel the Center for Fire Research at the National Bureau of Standards should be adequately funded to continue their role in fire suppression, prevention, and firefighter safety research.

We are continually facing new hazards from fire with the development of new materials that are hazardous when burning and we need new types of equipment and techniques to combat these hazards, as well as updating our present equipment with new developments.

The National Fire Academy, with its residential and field programs, has been of great benefit to the more than 500 volunteer and career fire departments in the State of Maryland as attachment I to this statement shows. We believe that all levels of government realize the importance of the firefighters' contribution when natural or manmade disasters occur. We urge the Federal Government to adequately fund the National Fire Academy that the residential and field programs may be continued. There is a great need for the specialized technical training and management skills that can be more cost effectively provided at the Federal level to all States.

We have copies of excerpts from "America Burning." We urge you to review the complete book. And I was very pleased to see that you have it right there with you.

If I may, I would like to allow Mr. King to give a few remarks.

[Attachment I to Mr. Carpenter's statement follows:]

(Attachment I)

MARYLAND "FIELD" ACTIVITY 1981 - 1986 YTD

FISCAL YEAR	DIRECT DEL. COURSES/STU.		ST. WKNDS. COURSES/STU.		WEO's COURSES/STU.		TOTAL COURSES/STU.	
81	4	135	NA		21	184	25	319
82	2	95	NA		21	107	23	202
83	4	119	2	144	12	88	18	351
84	5	165	3	135	14	97	22	397
85	9	314	3	118	13	174	25	606
86	4	136	4	191	9	60	17	387
TOTALS	28	964	12	588	90	710	130	2,262

ST. WKNDS. = MD State Weekend Program at NETC
WEO's = Weekend Educational Opportunities at NETC

MARYLAND RESIDENTIAL ATTENDANCE AT NETC

	FY 82	83	84	85	86	TOTAL
NFA	90	121	93	134	155	593
EMI	97	94	90	75	129	485

Senator **Sarbanes**. Certainly.

Mr. **King**. Senator, just to add a couple of things. I would agree that the State and local governments are the first line of fire defense and that, yes, we should and can provide the day-to-day programs.

However, the Federal Government, the Federal involvement, should be involved in the development and coordination of these programs.

To give an example, the fire prevention and education programs, the research and development, the administration, management, and leadership training are so vital, that why should the local and State governments reinvent the wheel, in each State, and in each county government.

One program that you saw outside just a few moments ago, why should every State, why should every county, why should every locality reinvent the same program to spin off time, energy, money savings?

It's there, a fine program developed at the Federal level with input from all around the country.

The National Fire Academy is a very needed leadership role in this particular area, as pointed out by that program right there. The Center for Fire Research, another very important and needed area in this country, the only emphasis that we have at the Federal level.

We must be adequately funded in those areas, though, and be adequately staffed. Here's another problem that's hit both the National Fire Academy and FEMA all over, and also at the Center for Fire Research.

The social and economic effects. On the homefront, we pointed out, where would we be with our fire problem, as it continues, even with the strides that we've made, with less homes, no jobs, and less people in our country?

We're still killing more people by fire than the Vietnam war did, and look at the money there. Look at the money and effort that's put into fire safety. It's nothing, no emphasis.

To close, the problem that we're still having is with the Federal Government cuts and the public apathy. It's still our biggest problem.

And gentlemen, America is still burning. Thank you.

Senator **Sarbanes**. Thank you very much, sir. Very good testimony.

Sergeant Spaulding, please proceed.

STATEMENT OF SGT. ROMEO O. SPAULDING, NATIONAL LEGISLATIVE LIAISON, INTERNATIONAL ASSOCIATION OF BLACK PROFESSIONAL FIREFIGHTERS

Mr. **Spaulding**. Thank you, Mr. Chairman.

I hope this is not the way that things will continue downhill. [Laughter.]

I'm Romeo Spaulding. I'm the national legislative liaison for the International Association of Black Professional Fire Fighters. But before I get into this, Mr. Chairman, I'd certainly like to commend you for holding this series of hearings and, most specifically, this one today, to deal with the safety aspect from a national perspective.

And also, I remember your stand on education. I was one of those on the Maryland State Board for the Conference of Parents and Teachers when you stood behind us with education here in the State of Maryland and also on a national basis, and I see your commitment still continuing and being transferred into this area. So I know we have a good advocate in that area. So I want to thank you for that.

The International Association of Black Professional Fire Fighters is comprised of approximately 10,000 black and minority firefighters across the country. We're located in 40 States and we have 85 chapters. Additionally, we have some 25 chiefs who are chiefs of major fire departments, metropolitan fire departments also a part of this organization.

During our 16 years of existence, the IABPFF attempted to address several areas of major concern within the fire service. They were, No. 1, the need to increase the recruitment, hiring, and advancement of black and minority citizens. No. 2, to identify, address, and take appropriate actions to eradicate racial injustices in all areas of the fire service. And No. 3, to promote the development and implementation of effective, proactive fire service delivery programs.

The actual addressing of these concerns required implementing new strategies designed to dismantle traditional behavior that was found to exist throughout the fire service which served as the main basis of maintaining and promoting discrimination.

After making tremendous strides in these areas over the past 16 years, we now find ourselves faced with many of the same perilous conditions in 1986. There is an attempt by the present Administration to dismantle all of our affirmative action gains which has caused a resurfacing of racial discrimination against blacks and minorities within the fire service. Also, the Administration's waivering support of the U.S. Fire Administration and fire programs in the past and present abandonment of same in the fiscal year 1987 Federal Emergency Management Agency's authorization proposal demonstrates again the insensitivity of this Administration's attitude toward a unified Federal fire focus. These attitudes will result in an increase in fire deaths, injuries, property loss, insurance premiums, and incident deficiencies which will cost the American public hundreds of billions of dollars.

The economic impact within the first year alone ranges around $25 billion in losses and increased cost of support services. So that would show you the type of economic impact that the present direction would take us on.

Basically, when you pose the question as to what, I guess in my view, are the economic and social costs of the reduction in Federal support for fire prevention research and safety, if you had listened very carefully to what I read initially about some of the things that the fire service was working on to try to overcome, and then if you would take into account the present direction of the Administration in dealing with the fire service and what we term as a very insensitive approach, you would find that some of the social ills that we thought that we had overcome have resurfaced, and I indicated those to be within the judicial area.

If you would look at the economic aspect, you've heard all of the other speakers give you all of the different statistical analyses about the cost. But collectively, we see that that would range in the area of about $25 billion of actual cost to the American public.

Now if that doesn't raise an eyebrow, I don't know what will, because we're talking about the collectiveness of all of the different types of reductions that would cause an increase in cost in one way or another to the American public. That's out of their pocket expenditures, and one of the areas that was mentioned was insurance premiums because, indeed, as you know now, the insurance companies began to evaluate their approach and how they manage themselves.

I use the term "manage themselves" because it appeared that they have been so doing in the past. But now they want to make more money off the American public, so they are raising the premiums or cutting off premiums to certain citizens, so they desire.

So we want to just bring your attention to that area.

The other area is the fact that the U.S. Fire Administration dealing with the Center for Fire Research at the National Bureau of Standards, in looking at what those entities have done in the past, I don't think we can underestimate the impact that they have had and neither can we underestimate the impact that they will have if they are not continued.

The funding level of those areas have never been attained as recommended from the issuance of "America Burning." As a matter of fact, it has been underfunded, understaffed. The Administration has been, I would say, more politicized than anything else you can think of, just about, in the Federal Government. And that has led to a demise of the type of leadership that you would expect to have within an agency with that particular type of mandate.

You had asked the question earlier about some of the problems that had occurred in the change of leadership there and, of course, with the past leadership, and how does that affect the State and local levels.

I would submit to you today, Mr. Chairman, that it does directly affect State, local, and any other level that receives any funds coming through that particular conduit because deficiency within the administrative aspect that subsequently affects its personnel, and personnel is not there to handle it properly, with it you would have a delay in program administration—excuse me—program distribution, problems in the administrations of those programs to the effect that when the funding year ends, you have millions of dollars that you can't get through the process and where you'd have programs affected, that does indeed affect the State and local levels.

So those are some of the things that have happened. And if you would continue that particular trend of thought and look at the types of proposals that are being directed through the Administration impacting on that particular agency today, you would find that it would be even more tragic.

We heard mention about the student stipends. I would submit that from the International Association of Black Professional Fire

Fighters' standpoint, we've had a very difficult time just trying to get students from our organization through the maze of admittance procedures into the National Fire Academy. That has been worked on and they haven't really corrected it even to date. But if it is allowed to change where there are no student stipends, where they're not there, then I would submit that we would probably have no one there, or very little, if any.

So that's a very direct impact. And the reason why I'm raising this problem from, say, the black and minority aspect is because if you look at the fire problem, the statistics, rather, over the past and you use the term 6,000 deaths, approximately, I think, 4,000 of those deaths are occurring within residential facilities. Approximately 85 percent of those deaths that are occurring at residential facilities are black and minorities.

The people who have been burning up in this country even when America was burning and even today are your black and minority citizens, those who reside within the ghettos of your cities, those who, for the most part, are residing within substandard housing within your rural areas.

That does not mean that others aren't burning up, but I'm saying that they have been the most victimized part of your population.

So that's what I want to raise your attention to today and to say that we do have a keen interest in this particular approach, a keen interest in maintaining, and not only maintaining, but in increasing the Federal focus and the Federal direction toward the fire problem, reducing, rather, the fire problem in this country.

To change the Federal Government's role in managing and overseeing what we call the Federal fire focus I think would be a tragedy. There are several things that have happened, I think, in the past that would point that out.

You can't turn over to the private sector the types of initiatives that are needed within research and development, the handling of new materials and things that would deal with firefighter health and safety, the aspect that you would deal with the residential sprinkler development.

The reason being is that, for instance, residential sprinklers, when that was being developed, it's a very good device. We recommend it, highly recommend it. But we had the private industry, that is, plastics and everyone else coming in saying, no, plastics are not good. We had those kinds of fights. But it takes a neutral party to come up with the development, effective development of those types of initiatives. And that's where the Federal Government falls into play because I don't think the private sector is ready to do that and I don't think they can. It hasn't been demonstrated in the past in this country.

The other thing is that when you look at the training of the people within the fire service profession, we were speaking earlier about the National Fire Academy. The fire service has just begun within the past decade to unify its administrative approach to mitigating emergencies. And it has come somewhat under the scrutiny or under the type of context that you would find within the military training of its officers, of how they unify their approach in mitigating what we call national emergencies or the types of things that they would encounter within the military.

That's where you're sort of going with the fire service. To turn around at this point and say, OK, we'll turn the training back over to the States—the States at this point have not come up to the unified level of what we call a training approach with the fire service. Even though there has been a considerable amount of development to this point, it is not to that point where that can happen.

The other thing is that the States do not have the dollar resources to even take over that which the Federal Government is now saying we're going to give to you. We feel that it is your right to do these things and then the fire service, they don't have it.

You were speaking about the termination of revenue sharing. The Federal revenue sharing dollars have benefited the States over the past years very much. In the fire service or emergency services area, they had done a tremendous job in helping police services, fire service, emergency medical, all of those areas, to improve their equipment, to improve their training, improve their whole approach in emergency management concepts. They're not ready at this point to take it over because they do not have the structure, the dollars, and neither without the commitment of the Federal Government and, most importantly, without the commitment of the Administration, you will not have a commitment at the State level, because it seems as though you're dumping something onto the States, that you're saying that, you take this problem and do what you can with it.

And, believe me, that's where the fire service was before the establishment of the U.S. Fire Administration. There were so many fragmented approaches to the whole fire problem and there was no way that you could get an understanding of it, statisticwise or anything else, until they started pulling it together.

That brings me to another point, the gathering of statistics.

The statistical base that is now developed is not fully developed as related to what is happening within the fire service area. We have been working on that in the past 10 years, pulling it together, and even today we do not have a complete statistical network that we can tell you exactly what's happening any place within the United States within the fire service because we do not and have not tapped in all of the fire departments across this country.

So that would just tell you that it is not the time for the way that the Administration is dealing with this. And I would submit to you also the way that the Administration is forcing the Congress of the United States to come up with a showdown of trying to take the reflection off of its own shortsightedness and inadequacies within these areas.

I put it into the same focus as it has done with the South African problem, and what they did with the Gramm-Rudman, with the budget cutting, and what they have done with the tax.

I would submit that it's a strategy that is being employed by the Administration to force the Congress to do what it can't do and, of course, try to save face in some sense with the American public. And I would submit that that is not the right way to approach any type of problematic areas within the United States and more specifically, the fire problem or the emergency areas that you're dealing with here today.

So those are just some of the things that we have seen here.

Now the second question you raised was what do you see as the appropriate Federal role in fire safety research and prevention. And I think I've sort of hit on those as I went through here just to try to balance them out as I walked through the scenario that I gave to you.

I do have a written document that goes back into some of the things with specific responses that I will provide to you subsequent to this.

Senator SARBANES. We would like to have that.

Mr. SPAULDING. So that was just an impromptu talk through this particular process to give you the perspective as we see it, and of course we certainly encourage full funding and the reversal of the present approach to underfunding, zerofunding of the U.S. Fire Administration, the Center for Fire Research, and of course any of the other areas that impact within the emergency services area.

So thank you very much for giving me an opportunity to appear before you today and I will be happy to answer any questions that you have.

Senator SARBANES. Thank you very much, Sergeant Spaulding.

Mr. Rouse, the Maryland State president of the International Association of Firefighters, has submitted his testimony. I gather he's not been able to make this morning. And that testimony will be included in the appendix to the record.

I just have a few questions to ask the panel members.

As you know, the Administration's budget request is for no appropriations whatever for the U.S. Fire Administration, no appropriations whatever for the Center for Fire Research, and cuts in the appropriation of the National Fire Academy of about 25 percent for the current year.

In the budget request, the Administration justifies the elimination of the Center for Fire Research in the National Bureau of Standards and, in fact, they've made the same argument in other areas as well, on the grounds that the activities are more properly the role of private sector and State and local governments.

I'd like to get some reaction from some of you at least to that assertion, which accompanied the budget request that, in effect, eliminated these agencies.

Mr. CADDINGTON. Senator, if I may, the fire service traditionally has a major role with enforcing the fire codes of this country. It's essential that we have a governmental agency that we can go to for technical guidance regarding the application of fire codes, building product, development, as it relates to fire spread, smoke generation, and so forth.

We have relied heavily in the past on the Center for Fire Research to provide us with technical information upon which the local governments can base the development and application of building code and technology.

We feel it would be devastating if we did not have the availability of the Center for Fire Research to assist us in that effort.

Senator SARBANES. Mr. Gerard.

Mr. **Gerard**. You know, we've heard this argument several times. In fact, it becomes an annual argument. It's as ridiculous today as it was 3 years ago or 5 years ago.

I think a couple of examples that are current right now—you know, 50 years ago, I think the first bill was introduced in Congress to begin to regulate cigarettes. And coming from a tobacco State, I'm sure you're very sensitive to tobacco legislation and how it moves through Congress.

One of the issues in dealing with fire-safe cigarettes has been the research. The Center for Fire Research is the only place where someone can do that kind of research. It cannot be done in the private sector. It is absolutely impossible. It must be done, because when the research is finished, there has to be someone with the credibility of the National Bureau of Standards to say, these are the facts. Anyone who can tell us how much a pound weighs or how long an inch should be can tell us reliably whether this is going to be a fire-safe cigarette or not.

I don't think the private sector can do that. There would always be the question, were they biased one way or the other? The Center for Fire Research is unbiased. I think they've demonstrated that over time.

Second, from the standpoint of doing this in the private sector, there is no place in the private sector that has the type of research facility that exists in Gaithersburg. Underwriters Laboratories does have some research facilities, but they're scheduled full time on research that industry pays for. Factory Mutual Research is in the same situation, Southwest Research. I think those are probably the three largest private research laboratories and they are paid to do what they do.

So there isn't any place in the private sector. Having come from one of the larger cities in the United States, Los Angeles, we did some research there, but not the kind of research that can be done at the Center for Fire Research.

And even the research that we did was paid for by the Federal Government. We worked with the U.S. Fire Administration to do some research, early research on the sprinkler programs and the smoke detectors. But it strictly is ad hoc, in-the-field type of research and it's not laboratory research. There isn't any place where what the Administration would like to assume could be transferred to the private sector or to State and local government, there isn't any place to do that and there aren't any funds to do it, either.

And the third element that I think is really critical, a lot of the research that's done in the universities on fire is funded through the Center for Fire Research. There are credible, responsible scientists at the National Bureau of Standards that can evaluate programs that are being conducted in universities and that are funded through the Center for Fire Research.

Without that oversight by competent, qualified scientists, then there would be no coordination at the university level in their research and there would be maybe three or four places working on the same thing.

So I think it pretty much has been laid down over time that while it may be a wonderful idea, it is totally impractical and is not possible to do.

Senator **Sarbanes**. Unfortunately it keeps coming back and I don't know how you finally put it to rest. It is in some ways very frustrating to have to keep confronting it. Obviously OMB is hoping that the context in which the issue is considered—you know, worsening budget situation, tighter budgets, assaults of this sort taking place across the board—is going to work to their advantage, so that they can either succeed or at least partially succeed in the amount of these appropriations.

Actually, the appropriation last year was less than it was in 1985, total for the three activities. That reflects the situation, although I think we've managed to keep them going.

Let me ask you this. I'm extremely concerned that if these organizations are dismantled or so severely cut that they are crippled, that even if you were subsequently to come to your senses and seek to rebuild them, that there would be enormous difficulties in achieving that. I mean, with all the problems, at least you've put together an organization, you have some competent people and there are programs that are working and ongoing.

Now if all of that is either terminated or severely crippled, even if you later realize that you made a mistake, how much of a problem is involved in gearing back up to anything approximating the level that we're at now?

Mr. **Gerard**. I think that's perhaps part of the problem that the U.S. Fire Administration and the National Fire Academy are dealing with right now.

Senator **Sarbanes**. Yes.

Mr. **Gerard**. Three years ago, I think it was, they did dismantle the U.S. Fire Administration and the National Fire Academy. At least they made a strong effort to do that.

Senator **Sarbanes**. Right.

Mr. **Gerard**. Congress reinstated the money, but by the time the money was back in, the people were gone and the U.S. Fire Administration and the National Fire Academy had to start almost all over again to rebuild their staff. And since that time, every year there's a zerofunding recommendation coming out of the Administration and I don't think it's any surprise that Federal Government employees look at an organization that's teetering on the brink of extinction and they don't want to go to work there.

So it's very difficult.

Senator **Sarbanes**. And, of course, the ones who have the best employees are the ones who have the best opportunities to go elsewhere.

Mr. **Gerard**. That's correct.

Senator **Sarbanes**. So they see this situation—the people who move out, often, although many of them are very dedicated, hang on because they're committed. But if they make a judgment, the best ones are the ones who most easily can go somewhere else.

Mr. **Gerard**. That's right. They really do have a problem in recruiting and maintaining the best qualified people. They are doing that. But I think the U.S. Fire Administration has authorization for 20 people.

Senator **Sarbanes**. I know. Let me ask a more far-reaching question. I was interested in the figure that said 90 percent of all the firefighters are volunteers. And Mr. Carpenter, you and Mr. King may want to get into this one as well.

As firefighting becomes more complicated, is there a morale problem in getting volunteers? I know they're an enormously dedicated and enthusiastic group of people. But how much of a morale problem is it if we can't give them the training that they feel brings them up to something approximating a professional level?

In other words, you get some guy who's terribly enthused. He really is committed to doing this. Then you get him in. Then he starts confronting really complicated situations.

How important is it, in terms of holding on to good people on the volunteer side of firefighting, that they get the kind of training that takes them to a level of some professionalism?

Mr. **Carpenter**. It's very important. We've noticed this. It even comes down to if a department becomes a little lax in drills, they'll find people getting unhappy.

The volunteers want the training. They want to be the best firefighter they can be. They're begging for training all the time. The Maryland State Firemen's Association just worked on a 10-year training plan that we just developed. We're right now going to Annapolis trying to get some State funding to build regional training centers.

But this, in my opinion, doesn't replace the need for the type of training that can be gotten in Emmitsburg where we would only be supplying a few people and then a few from some other State and some other State, and bring them together to give them a specialized program that we couldn't afford to give them on the basis of just one or two people from an area.

But definitely, the volunteers I know have always, they're always begging for training and they fill up the classes when we offer them classes.

Our problem is not getting the classes filled as much as it is getting the funding to give the class. That's the problem.

Mr. **King**. Volunteerism, from the current Administration, a few years ago, a big emphasis, media blitz all across the world about volunteerism in our wonderful country.

What's happened to it? President Reagan, specifically, volunteerism—do this for your community. This is the volunteer spirit.

A term that's used around the country—professional firefighter. Professional fireman. That does not say whether you are a volunteer or a career-paid person. The term "professional" refers to that individual and the amount of training, dedication, experience that that individual, whether it be a male or a female or black or white, whatever, the term professional, it might be a volunteer.

I am a professional, a volunteer, and darn proud of it. I've also been on the career side of it for years until I retired.

But the biggest problem that we're having with the volunteerism in our State, and this is quite true across the country, is the time problem. Today's social, economic, the individual is working two, three, four jobs to put bread on the table. They have a time to give to their community to volunteer. How much time do they have? With the amount of requirements that are placed on that individual to become that professional firefighter and the amount of training that's required, a lot of it is through the EMS fields. You have, starting out with a basic type of first aid or first responder programs and then going to the emergency medical technician level, then going to an IV tech, then going to a CRT and an EMT, paramedic—some people are calling them at this point, they might as well be doctors. And then recertification.

Well, it's getting to be the same thing in the firefighter level as well. How much time does that individual have after he's working two and three jobs, has to mow his grass, he has to maintain his automobiles, has to spend a little time with his kids and his wife, how much time does that individual have?

He has to go out and get the training. He has to also maintain fire apparatus, his fire station in his community. They also have to raise their own funding to take this training to put fuel in the fire apparatus, to paint the firehouse, this type of thing.

So I think out biggest problem is time. And through the Federal level, some of these requirements of training and so forth can be developed and coordinated at that particular level, which you would send one person to the National Fire Academy, the spinoff, the trainer program that is involved a lot with the National Fire Academy. That brings it back down to your community.

Instead of that individual having to go umpteen miles or days or weeks financially and time, he can do it back at his own fire station. A lot has come about in recent years with a lot of the video programs. An individual can at his own time and convenience take a lot of the training to become more professional, to do the volunteerism at his own department.

Senator **Sarbanes**. Sergeant Spaulding.

Mr. **Spaulding**. I was going to say they have another thing, that's the liability factors. The liability factors are increasing on all kinds of things. So that's added pressure. And especially in light of what he's talking about. If you don't have the training, if you can't get the time to do certain things and all of a sudden you're getting information about liability of response, you know, what happened, that's added.

Whether or not someone wants to volunteer to do something when they know that maybe they may not have the liability backing that they used to have, and it's changing.

So that's a new area.

Senator **Sarbanes**. Do any of you perceive that the U.S. Fire Administration or the National Fire Academy or the Center for Fire Research is currently engaged in activities that would be done elsewhere to any significant degree? Or is it your perception that if these agencies didn't exist, most of those activities would not take place?

Mr. **Caddington**. I think that's a fair statement, speaking for the International Association of Fire Chiefs. There's just no other agencies or organizations out there that could supplant what the Federal Government is providing through the USFA at this time.

It's just not there, nonexistent.

Mr. **Spaulding**. Your quality of programs would drop. Your consistency of programs would drop.

In other words, it couldn't happen.

I was listening to Mr. Gerard explain one aspect. There's another area which—I'll give you an example—the Center for Fire Research is involved in: smoke toxicity.

In the private industry, if you turn that loose, I don't think anyone would tell you that my product is more toxic than someone else's because that's not a good PR approach to it. However, the Center for Fire Research can actually do that type of research and utilizing the collegiate level of impacting within that area and give the type of informational base within toxicity reporting that could be used not only by the fire service, but would be most amenable to the general public of the United States.

That couldn't be done any place else.

Senator SARBANES. Actually, I don't think it squares with reality to assert that if the Federal Government withdraws—assuming it's playing a proper role, which I believe it is doing here—others will move in and pick it up, I don't think squares with reality.

In fact, what may happen is that the example set by the Federal Government will be followed by others. In other words, they then withdraw to some extent because the idea is communicated, that the problem isn't as pressing as everyone thought it was. What you really need is an overall coordinated approach, which it seems to me we've been trying to develop here.

I think it was you, Mr. Gerard, who pointed out the amount of money committed is far less than what "America Burning" recommended and less, I think, than the problem requires.

But, nevertheless, we at least have these systems working. We have a training academy. We have a research center. We have the U.S. Fire Administration moving these programs out and across the country, bringing people together in a coordinating role.

I think that if that whole program is undercut, it's all going to go back to people operating within a small environment, not fully aware of what's taking place elsewhere. You may be able to afford to do a certain training program. But you need a second to relate to in order to make the first a success.

Mr. KING. Project FIRES is another example of what you're saying there. If Project FIRES was dissolved, with the development and research and testing into protective clothing for the firefighter, is private industry going to take that over? What are they going to be into it for? To make the dollar. That's what they're going to be into it for. So they're going to try to prove that theirs is the best.

If they're successful at that, look at the cost that's going to go there. It would be prohibitive to the individual firefighter from purchasing that particular type of gear.

Project FIRES, even though it's slowly moving right now, they are evaluating all phases of this. It's at an accreditable level. That's another thing—accreditation with the Federal involvement in it.

Senator SARBANES. Well, gentlemen, thank you very much. You've been a very helpful panel. We appreciate the time and effort you've put into this.

Mr. KING. Thank you.

Senator SARBANES. Our concluding panel will consist of Mr. Frederic Clarke, president of the Benjamin/Clarke Associates, a fire risk consulting firm, and former Director of the Center for Fire Research; Ralph Jackson of the Allstate Insurance Co., the advocacy programs director; Mr. John Bryan, chairman of the Department of Fire Protection Engineering at the University of Maryland; and Mr. Walter Berl from the applied physics laboratory of the Johns Hopkins University.

Gentlemen, we're very pleased to have you with us. We appreciate your patience in waiting through the morning and into the lunch hour.

Mr. Clarke, why don't you lead off.

STATEMENT OF FREDERIC B. CLARKE III, PRESIDENT, BENJAMIN/CLARKE ASSOCIATES, INC., AND FORMER DIRECTOR, CENTER FOR FIRE RESEARCH, NATIONAL BUREAU OF STANDARDS

Mr. CLARKE. Thank you, Senator.

My name is Frederic Clarke and I'm president of Benjamin/Clarke Associates, which is a fire protection consulting firm located in Kensington, Maryland. Before we established that firm in 1981, I spent 3 years as the Director of the Center for Fire Research and at the same time I was also the science adviser to the U.S. Fire Administration.

I appreciate the opportunity to be here today and to share with you the perspective that we have gained from practicing modern fire protection both in the public and private sector.

It's been pointed out today already that our fire death rate has declined in this country sizably since the Federal Government recognized the need in the early 1970's to take an active role in some aspects of the fire protection needs of this country.

Our fire death rate has declined over 25 percent and that means that there are 14,000 people who are alive today who would not be here if our fire rate had not so come down. Some 300 of those are Marylanders.

And, of course, there have been lots of developments that have contributed to this, some of which have already been discussed today, notably smoke detectors. That is a device for which the technical underpinnings and the test methodology were developed by the Center for Fire Research.

Two other measures that we don't think about, but are very important in bringing down fire loss is our existing Federal requirements for ignition resistance in carpets and mattresses. The mattresses that you can buy today and the carpets that you can purchase today will not ignite from a small ignition source like a lit cigarette. That requirement is the direct result of research done over the years at the Center for Fire Research.

We have upholstered furniture which traditionally in this country, along with mattresses, has contributed to 40 to 50 percent of all fire deaths. There is now a program developed by industry based on research at the Center for Fire Research which is a code of manufacturing whereby for the first time you can buy ignition-resistant upholstered furniture. So now it's possible for the consumer to go out and to recognize that he can purchase furniture which is not going to contribute the same degree of flammability as things in the past.

Those measures, among others, are things that I don't think we would have if we didn't have the Center for Fire Research.

Those are also yesterday's challenges and they don't necessarily respond, other than establishing a record for an effective program, they don't necessarily respond to the challenges of tomorrow.

Indeed, there's a particularly tough task facing the fire community right now which Sergeant Spaulding alluded to, which is one of smoke toxicity. There's great public concern over the effects of toxic fumes generated when materials burn. That issue has a strong emotional component, commercial implications, and liability implications, as well as just the normal technical difficulty of trying to unravel all of the materials, toxic smoke effects and its other flammability effects, all of which are very important in contributing to its overall hazard.

I don't propose to talk about the pros and cons of that technical issue today, but it's important to note that the State of New York is contemplating writing a toxicity testing requirement into its building code, and other States, including Maryland, have had similar legislation proposed.

Mr. Chairman, to put it in single terms, the smoke toxicity issue has the potential for a real catfight between various commercial interests, taking place in front of a regulatory community which wants to do its best to protect its citizens, but is confused and is troubled by the various claims and counterclaims which surround the smoke toxicity issue.

We need a neutral party, one which has no ax to grind, in this debate on combustion product toxicity. But furthermore, they have to be technically skilled enough to be able to provide sound and practical advice.

It is not the sort of research that can easily be done at the State and local level. It requires sophisticated experimental facilities, highly specialized personnel and at least for the moment, sizable computational capabilities; that is, big computers.

These are and have been supplied by the Center for Fire Research, which functions as an adviser to the building code officials, the fire marshals, and others within public safety, as well as to the private sector interested in maintaining and improving the fire safety of its products.

It doesn't require a profound analysis to realize what would be required to duplicate that kind of facility. Even at the State level, to multiply it by a factor of 50 doesn't strike one as a tremendously efficient use of resources.

This notion that has been suggested before that the Center for Fire Research, and I think by extension, other parts of the Federal fire program, that they could be established as an independent research organization and solicit funds from industry for their continued support, just isn't going to work. The smoke toxicity issue is a very good case in point.

Making the center a captive of one sector of the economy automatically makes it beholden to any one side in an area where public safety needs have to be balanced against private costs. Even if the research done is absolutely right, as Mr. Gerard pointed out, even if the Center for Fire Research is able to say, without any technical doubt, that a given set of technical facts obtains, its source of support from the private sector calls into question those conclusions. It, at the very least, slows their adoption by various building codes and regulatory authorities because they need, then, to satisfy themselves that that set of findings is, in fact, as unbiased and complete in the future with private funding as we now have assurance that it is with public sector support.

Many of the points that are in my prepared statement, Mr. Chairman, have already been raised today eloquently by others. So rather than go forward any more, I would simply ask that my testimony be entered into the hearing record and at the appropriate time I'd be happy to respond to any questions.

[The prepared statement of Mr. Clarke follows:]

PREPARED STATEMENT OF FREDERIC B. CLARKE III

Mr. Chairman, my name is Frederic Clarke, and I am President of Benjamin/Clarke Associates, a fire protection consulting firm located in Kensington, Maryland. For three years prior to establishing my firm, I was Director of the Center for Fire Research at the National Bureau of Standards. During that time, I was also Science Advisor to the United States Fire Administration. I appreciate the opportunity to appear before this Committee, and to share with you the perspective gained from practicing modern fire protection techniques both in the public and the private sector.

When the Federal program in fire began in 1975 with the establishment of the U.S. Fire Administration, the Center for Fire Research and the National Fire Academy, this Nation's fire death rate stood at about 45 per million population, the highest in the industrialized world. In 1985, America's death rate is near 32 per million population: this is a decrease of over 25%. Put another way, there are 14,000 people alive today who would not be here if our fire death rate had not declined. Clearly, there have been many developments which have contributed to this reduction, but it is safe to say that the Federal role has been important, not only in fostering new technology and fire protection concepts, but in heightening the Nation's awareness of its critical fire problem. At the same time, improved understanding of how fires behave, and how people exposed to fires react, has resulted in building codes which have become more flexible in their fire requirements, often permitting not only increased safety but also decreased costs of fire protection.

The Center for Fire Research has made many contributions to reducing fire losses. Three of the most significant are:

- the test methodology which underpins today's residential smoke detector, a device which is present in 75% of the Nation's households;
- Federal requirements for ignition resistance in carpet and mattresses;
- research which prompted a code of manufacturing practice whereby the public can purchase ignition resistant upholstered furniture.

Since mattresses and upholstered furniture together account for over 40% of all fire deaths, one expects to see the continuing benefits of these measures as the existing inventory of furnishings in residences is gradually replaced by modern, safer products.

These, however, are yesterday's challenges. That they have been met successfully does not mean that the battle against fire has been won - - far from it. Indeed, a tougher task, the question of smoke toxicity, lies ahead.

Today there is great public concern over the effects of toxic fumes, generated when materials burn. The issue has a strong emotional component; it raises troublesome commercial and legal questions for materials manufacturers; and it is a difficult area in which to develop technically sound regulations. It's a very tough problem. The State of New York is contemplating writing a toxicity testing requirement into its building code, and other states, including Maryland, have had similar legislation proposed. I do not plan to discuss the pros and cons of smoke toxicity regulation here today, but it should be clear that, if ever there was a need for an unbiased and competent authority on this subject, it is now. This is a role for which the Center for Fire research is uniquely suited.

The Center has been slated for elimination by the Administration for the past four years. Each year, the Congress has restored its funding. The Administration argues that the work done by the Center can equally well be done by the private sector. Well Mr. Chairman I have been a member of that private sector for the past five years, and I can tell you that such an assertion on the part of the Administration is simply false. Products which are deemed "safe" have tremendous potential commercial advantages over those which are not, and this is not a determination which the private sector can, credibly, make for itself. Furthermore, since the technical issues surrounding smoke toxicity are complex, today's regulators must be backed up by modern fire hazard assessment techniques. In short, Mr. Chairman, we need a neutral party, one which has no axe to grind in the (largely commercial) debate over combustion product toxicity, and one which is technically skilled enough to be able to provide sound and practical advice.

This is not the sort of research which can be easily done at the state and local level, since it requires sophisticated experimental facilities, highly-specialized personnel and, for the moment at least, sizeable computational capabilities. These are, and have been, supplied by the Center for Fire Research, which functions as an advisor to building code officials, fire marshals, and others with a brief for public safety, as well as to the private sector interested in maintaining and improving the fire safety of its products.

In my view, it will be at least three, and probably five, more years before we are able fully to make sense out of the role toxic smoke plays in the overall fire hazard of materials. There are many things that we can do right now, but more fundamental work is needed. Like it or not, the only place where this work can be done with sufficient credibility that it will be quickly accepted and implemented, is in the government sector. At the moment, this means the Center for Fire Research.

This is not to say that the United States must maintain a large fire research facility indefinitely, though I see a continuing need for a fire research capability of some size, even after the present emergency is over. Whatever size capability is eventually decided upon, is is crucial that once it is established, it be maintained. That is, the continual chipping at the Center's budget, and the uncertainty which arises from each year's budgetary high wire act, must be stopped. Putting a research facility in an environment where its funds are continually under attack, gradually eroding its base by small cuts or failing to correct for the inroads of inflation inevitably reduces the facility's capability. It is also a poor environment in which to do research. It is hard to expect even the most dedicated staff to concentrate unreservedly on difficult technical problems when there is continuing anxiety over who will have jobs at the end of the fiscal year. In my view, the management of the Center, and NBS, have done a superb job maintaining the quantity and quality of the research done by the Center in the face of such uncertainty for the past four years. It is, however, unrealistic to expect these stresses not eventually to have their effect.

Deputy Commerce Secretary Brown has suggested that the Center for Fire Research be established as an independent research organization, and that it solicit funds from industry for its continuous support. While I believe that some support from industry is both reasonable and appropriate, making the

Center a captive of one sector of the economy, i.e. the private sector, or any forces within that sector, automatically makes it beholden to one side in an area where public safety needs must be balanced against private costs. In my view, this is poor policy.

Thank you, Mr. Chairman, for letting me express these views before the Committee today. I will be more than willing to try to respond to any questions at the appropriate time.

FREDERIC B. CLARKE, III, Ph.D.

Professional Experience*

Frederic Clarke is president of Benjamin/Clarke Associates, Inc., risk analysts specializing in the characterization and analysis of fire safety problems. Until fall, 1981, he was director of the National Bureau of Standards' Center for Fire Research, the nation's principal Federal fire laboratory. He was also Science Advisor to the United States Fire Administration.

Prior to coming to NBS, he spent three years in the research and marketing departments of Monsanto Company, St. Louis, Mo. In 1976, Clarke was one of twenty-three Federal executives chosen to receive a Congressional Fellowship. As a Congressional Fellow he served as legislative assistant to Senator John Culver (D.-Iowa), specializing in economic and product liability legislation; and as staff assistant to Congressman Jim Wright (D.-Texas), the House Majority Leader.

Education and Honors

A.B., Washington University, 1966
Phi Beta Kappa, Sigma Xi
A.M., 1968, Ph.D., 1971 Harvard University (Physical-organic Chemistry)
National Science Foundation Predoctoral Fellow at Harvard, 1966-69; Teaching Fellow in Biochemistry, Harvard, 1967-71.
Congressional Fellow, 1976-77
Chairman, Panel on Fire Research and Safety, U.S.-Japan Cooperative Program in Natural Resources, 1978-81; Associate Member 1985.
Member, Committee on Fire Toxicology, National Academy of Sciences, 1985-86.

Professional Affiliations

Member, American Society of Testing and Materials (ASTM), Committee E05; Subcommittee on Product Liability, ASTM Research and Technical Planning Committee, 1978-79
Member, National Fire Protection Association (NFPA)
Member, American Chemical Society
President, Congressional Fellows Association
Member, Board of Directors, Congressional Fellowship Program, American Political Science Association
Member, Steering Committee, National Fire Research Strategy Conference, 1985.
Member, Editorial Review Board, Fire Technology

* For biographical information, see Who's Who In America, 1984 ed.

Senator SARBANES. Thank you very much for a very helpful statement. The entire statement will be included in the record.

Mr. Jackson, please proceed.

STATEMENT OF RALPH J. JACKSON, DIRECTOR, ADVOCACY PROGRAMS, ALLSTATE INSURANCE CO.

Mr. JACKSON. My name is Ralph Jackson. I am director of the advocacy programs for Allstate Insurance Co. My responsibilities there include the identification of significant loss causes, the design of programs to make measurable reductions in these losses, and the formation of effective relationships, public and private, to try to reduce these burdensome and tragic losses.

I've served for the last 7 years as a member of the National Fire Protection Association Residential Sprinkler Committee 13-D and most recently completed 2 years as chairman of the board of the Insurance Committee for Arson Control.

I mention these two factors because I'm going to focus today on two projects that I've worked with through the U.S. Fire Administration. Both of these projects, by the way, were started many years ago—residential sprinklers and arson.

I want to point out that in the conduct of these activities, the U.S. Fire Administration showed a very businesslike concern for three factors. The first was to make measurable progress. The second was to leverage the Federal contribution to obtain considerable private sector contribution and involvement. And the third was to hand these programs off to the private sector in such a way that the level of Federal involvement could be lowered to one of oversight rather than leadership and in the funding area.

The residential sprinkler activities in the late 1970's were aimed at life safety and property protection. They used private sector contractors to accomplish these particular research projects. In doing that, they leveraged considerable private sector participation. The Los Angeles Airport Authority donated the houses that were used for the tests. The Copper Development Association donated the piping to equip the facilities. The Grinnell Fire Protection Systems people did the engineering. Marriott donated the furniture. Later on, when we wanted to dress the houses out for full fire tests for smoke damage as well as fire damage, the Allstate Foundation put in $10,000 to buy furnishings. And the insurance industry supplied quite a bit of manpower to help with the evaluation of the testing that took place.

Now these tests were so successful that since that time, over 10,000 private residences have become equipped with residential sprinklers.

On the commercial side, the Marriott Corp. has made a commitment and carried out that commitment to put residential sprinklers and quick-response sprinklers developed in these tests in all the habitational portions of their existing hotels and in all future Marriott structures.

Also since that time, another spinoff of the original Federal activity is the private sector testing being done by the National Fire Protection Research Foundation of quick-response sprinklers as they apply to commercial applications such as high-rack storage and the sprinklerization of distribution centers.

Now in doing this, they're protecting jobs. They're keeping materials from being destroyed. And they're keeping our distribution system working well. All of this is to the general common good.

It also helps to protect the tax base as well as jobs. Fewer lives are lost and fewer serious injuries are going to be suffered because of these quick-response sprinklers.

Moving to the subject of arson, it was described in the mid-1970's as America's fastest growing crime. Here, again, the U.S. Fire Administration followed a common pattern of coordinating the study group, funding promising pilot projects, and then handing it off to the States and private sector groups to continue.

A brief example of one way that was done. In the early leadership conference which they held back in the mid-1970's, they used the Battelle Institute to bring together leaders from around the country. There were several comments by people earlier today about the role of the Federal Government in convening groups which could not be convened at the State level. This was one of those examples.

As a result, a book was published which served as sort of a blueprint for the Nation to follow for the 10 years after that.

Just this last May, the Insurance Committee for Arson Control sponsored a reconvening of a national group to carry on that project. In that meeting, the U.S. Fire Administration took part, but instead of as the funder and the originating organization, they took the place as a valued adviser.

Now the States and regions who have picked up on this national strategy against arson have formed task forces and they've demonstrated that they can get more arrests and convictions, more hard-time sentences of arson perpetrators and you can measure the impact on economic arson.

But as someone pointed out earlier this morning, a very significant problem is that of juvenile arson, and that's a problem which remains to be addressed effectively.

Now for all the good work that's been done, our nation still has the world's highest fire rate. As one of the gentlemen commented earlier, we are better at suppression than we are at prevention. That's one of the challenges that faces us now.

But the line firefighter faces a different type of challenge. The materials that are used in building today are different. The types of architecture are different and unless they have some training program to help them to deal with these things effectively, we're going to lose more of our good firefighters through deaths and injuries. And we're going to pay an increased amount of taxes to cover the workers' compensation insurance and the early pensioning of the injured firefighters.

These are all serious considerations.

A comment was made earlier about the fact that if you don't do a national training program and do it well, that you would have to do it 50 times, and even though you endured the expense 50 times, it wouldn't be as good.

There's another factor that bears on that, too, and that's that not only is the Federal Government but the State and regional governments are trying to get greater private sector involvement. And that's not inappropriate. But the private sector cannot afford to go around to 50 States to do the same job 50 times, either.

So it's important that we have some place where in a businesslike manner we can make the best contribution possible.

A comment was made on the national fire incident reporting system. That's extremely important. If we don't have a national system for uniformly collecting statistics, we'll have 50 States collecting information in 50 different ways and with 50 different levels of completeness. We need to know where we are if we're going to do our programs well.

So, in summary, I'd like to say that we look for the U.S. Fire Administration to do federally what cannot be done effectively at the State level, and to feed those pilot programs, to accelerate the testing and acceptance of new technology which can then be picked up by the private sector and by the States, and to be responsible for the collection and dissemination of the best fire data available.

Two more points. There is a tendency to refer to private sector money as new money and to say we'll hand this off to the private sector.

I think it matters little to the individual citizen whether the money is paid as taxes or whether it's paid as increased insurance premiums or whether it's paid as increased local taxes. It all comes from the same place.

What we should be searching for is the most effective and efficient way to collect that money and apply it and make the best contribution we can.

The second, and closing, comment has to do with the most precious resource anybody has, and that's the personnel. There was some comment, a very good comment made earlier about the problem of the U.S. Fire Administration being perceived as under annual attack and what this does to morale or what it does to a person's willingness to come and serve the U.S. Fire Administration.

Right now, they're down to 20 people. That makes it extremely difficult to work with them as much as you would like to.

We in the private sector want to make a contribution. We have something at stake here, too. At one time in the insurance businesss, for example, it was seen as adequate if you simply sold a good policy and serviced it well. That's no longer accepted by the general public or by the industry. We now recognize that we have a need to help identify the problems that make insurance expensive and to work with the community to control the costs and make insurance not only affordable but available.

If we're going to do this, we need to be able to work with people who are going to stay around. And I would urge that we not only get proper funding for the U.S. Fire Administration, but give them a feeling of confidence in their future so that we can keep the best possible people.

Thank you very much for the opportunity to comment this morning.

[The prepared statement of Mr. Jackson, together with an attachment, follows:]

PREPARED STATEMENT OF RALPH J. JACKSON

My name is Ralph Jackson. I am the Director of Advocacy Programs for Allstate Insurance Company. In that position I am responsible for:

- ° identification of loss causes that contribute significantly to the cost of insurance
- ° design of programs to make measurable reductions in these losses
- ° formation of effective relationships with fellow insurers, other private sector groups and governmental entities capable of helping reduce these human and economic losses.

In carrying out these responsibilities, I have served for seven years as a member of the National Fire Protection Association (NFPA) subcommittee on residential sprinklers. Also, for the past two years I served as Chairman for the Insurance Committee for Arson Control (ICAC), an organization serving the majority of property insurance companies doing business in the United States. I presently serve on the ICAC Board of Directors.

I appreciate the opportunity to address this committee. My remarks are confined to two U.S. Fire Administration projects in which I have personally participated representing either Allstate or ICAC. At the conclusion, I will make a general comment on the Fire Administration and the Fire Academy. I hope that the narrow scope of my remarks will not be seen as a reflection on those Fire Administration activities with which I'm not familiar enough to comment.

In commenting on two projects, residential sprinklers and arson prevention, I will focus on those aspects of the projects which demonstrate the Fire Administration's determination to make measurable progress, their use of federal prestige and funds to leverage substantial private sector participation and their ability to hand-off the successful pilot programs to state and private sector groups.

RESIDENTIAL SPRINKLERS

At the time I joined the NFPA Residential Sprinkler Subcommittee, the Fire Administration representative was already there interacting with technical experts and industry representatives. They were working out the standards and conditions for a series of test burns to measure the life safety potential of a new generation of residential sprinklers. The decision was made to expand the scope of the tests to demonstrate the ability of the new system to reduce property loss as well as loss of life.

While the Fire Administration offered the starter money, the project received the following private sector contribution:

- two houses from the Los Angeles airport authority
- the Copper Development Association donated and installed the necessary tubing
- Grinnell Fire Protection systems donated the engineering design work
- the Marriott Hotels donated furniture
- the Allstate Foundation donated $10,000 to equip the tests with the clothing, drapes and other personal items to make it possible to assess the total economic impact of each test fire
- 14 men representing the property insurance trade associations and major companies formed an ad hoc committee to serve as advisors and eight companies contributed the services of ten adjusters to serve as a jury on the economic loss of each fire
- a copy of the ad hoc committee's report comparing economic losses in sprinklered and unsprinklered fires is attached to the printed copies of my remarks.

The project demonstrated the validity of the theoretical work as it applied to one and two family dwellings.

Since that time, the Marriott Corporation has cooperated in tests that demonstrated the value of modifying conventional sprinkler installations with the quick response sprinklers to cover the habitational sections of hotels. Following those tests Marriott made a commitment to retrofit all their existing hotels with sprinkler systems and to make them a part of all new Marriott construction. Cobb County, Georgia, has encouraged installation of modified sprinkler systems in multi-family construction to improve the quality of life protection.

The quick response sprinkler, developed and tested as part of the U. S. Fire Administration project, is now being tested for beneficial applications in business and industry. These extensive tests are being coordinated by the National Fire Protection Research Foundation and is funded totally by the private sector.

The result of the Fire Administration's leadership was to advance by many years the refinement and acceptance of this new sprinkler concept. As its use becomes more wide spread, communities will suffer less loss of housing stock. Fires will be less severe. Fewer firemen and civilians will be hurt and less of a burden put on the social services units by fire victims. Such an environment will not only be a friendlier one in human terms, the fire protection costs will become more manageable for the communities.

ARSON PREVENTION

Early in he 1970s arson was referred to as the nation's fastest growing crime. To help the country get a handle on this problem, the Fire Administration sponsored a two-day meeting of public and private sector leaders. At this conference the elements of the problem were identified and a long-range strategy was developed. The recommendations were published in the book Arson: America's Malignant Crime.

Next, the Fire Administration sponsored a broader leadership conference at Arlie, Virginia, to foster interaction between the private and public leaders needed to implement the strategies. These leaders went back home and served as program generators. Where the recommended programs developed, arson rates have dropped and convictions have risen

With the general task force programs set in motion, the Fire Administration turned its efforts to the development and encouragement of information based programs capable of predicting which structures were unusually vulnerable to arson...particularly fraud arson. The Administration followed the same pattern as before. They assembled the appropriate leadership group to design and implement programs at the community level. The Administration then sponsored a number of pilot programs to test the concept and its value to the communities.

There are two points to be drawn from the manner in which the Fire Administration launched these state and local level task forces and arson prevention programs. First, the strategies were not designed to be implemented at the national level. They were guidelines for implementation at the state and local levels. Second, the initiative has been passed to the private sector. On May 21 and 22 of this year, the Insurance Committee for Arson Control conducted a leadership conference to reexamine the problem, assess progress made in the last ten years and develop a strategy for the next ten years. This time the private sector was the host and the Fire Administration attended as a respected guest-participant. The information based arson early warning systems started with the Fire Administration's help have inspired a second generation of programs under the sponsorship of the Ford Foundation and the Insurance Committee for Arson Control. They are nearing completion of a five-city programs to test the value of more direct participation by neighborhood activists and local insurers in addition to the participants common to earlier programs.

GENERAL COMMENT

A reasonable person might ask why it is necessary for the Fire Administration to continue if it has done such a fine job of inspiring effective action at the state and local levels. To this I would respond that my experience with the fire Administration has touched on only a few of their responsibilities. While they have been able to reduce their level of involvement in those activities I commented on, there are many remaining opportunities that present themselves for significant reduction of the tremendous fire losses suffered annually in this country.

The world's highest losses of lives and property due to fire are suffered in the United States and Canada. These two countries also rank lowest among the well-developed countries of the world in their attention to fire prevention. The United States is very good at fire suppression. We should be; we get enough practice. That last remark should not be taken as a slur against our nation's firefighters. The tragic number of these individuals who die each year is a testimonial to their heroism and dedication. But, every year changes are made in residential building materials and the products stored in commercial ventures. The challenges facing firefighters increase each year. And yet, eighty percent of the firefighters facing these challenges are volunteers.

A critical service to the nation and the states is the National Fire Incident Reporting System (NFIRS). In the absence of this national collection and dissemination of fire data by the Fire Administration, we would have 50 states using 50 different systems. The absence of reasonably accurate data would put state and regional planners in a position where well-intended programs could waste resources and fail to provide the full measure of protection the citizens had paid for. Data is essential to cost-effective planning.

There is a great need for national leadership to help develop strategies to train fire service personnel for the job of prevention and public education as well as suppression. There is an equal need for strategies to improve the citizen's role in the fire prevention. The role of the Fire Administration and the Fire Academy in these activities is pivotal. In the absence of intelligent national leadership to help local government devise local solutions, there will be duplication of expenses in those states addressing the problem. There will be increasing losses in terms of human suffering and destruction of housing stock in those states that don't address the problem or follow an ineffective plan.

Few recent problems have been as important and difficult as the one facing you as you develop a plan to bring expenses under control. I appreciate the opportunity to come before you to urge that, as you consider what strategy to follow, full consideration be given to the continuation of three types of programs:

1) those federal activities which cannot be carried on effectively at the state level

2) federal pilot programs to accelerate the testing and acceptance of new technology

3) the collection and dissemination of fire data.

Thank you.

REPORT ON 1980 PROPERTY LOSS COMPARISON FIRES

published by

Ad Hoc Insurance Committee on Residential Sprinklers

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November, 1980

ACKNOWLEDGEMENTS

It is appropriate to mention that the sprinklered, non-sprinklered comparison fires would not have been possible except for the willingness of the U.S. Fire Administration to extend operation of the L.A. test site. Also the speed with which the property insurance trade associations made appointments to the ad hoc committee reflected their understanding of the unique opportunity to get information and the nearness of the date when both the test site and the USFA test team would be dismantled.

Damage estimating services for the project were supplied by Allstate Insurance Company, Firemen's Fund Insurance Company, GAB Business Services, Inc., GEICO, INA, the Insurance Services Office, the Kemper Group and State Farm Insurance Company.

It should also be acknowledged that the Allstate Foundation made a $10,000 grant to NFPA that enabled the test team to furnish the test site with clothing, appliances and other items that were not part of the originally planned sprinkler tests.

At the very start of the Los Angeles sprinkler tests, significant contributions were made by Grinnell Fire Protection Systems and the Copper Development Association (CDA). Grinnell contributed the engineering design work and CDA funded the materials and the installation of the test site sprinkler system designed by Grinnell.

The test site house and the adjacent headquarters building were made available, without charge, by the Los Angeles Airport Authority.

FOREWORD

This report has been prepared for use by insurance companies, insurance trade associations and related service industries in considering the impact of residential sprinklers on fire loss in dwelling properties. Had more time, funds and manpower been available, a greater number and variety of comparison tests would have been desireable. That the tests reported here did take place is an example of how federal and local governments and private industry can cooperatively take advantage of a unique, short-lived opportunity to develop beneficial information.

It is likely that the greatest benefit of residential sprinklers will be the lives saved and the injuries prevented. The focus of the ad hoc committee and this report, however, is on the single factor of property loss reduction.

This report is based on the matched-pairs of fires designed to meet the mission of the ad hoc committee These fires were a small part of the test series. Those interested in the procedures, results and conclusions concerning the performance of residential sprinklers will want to obtain a copy of the report on the entire series.

BACKGROUND

During 1979 USFA sponsored over 60 tests to investigate the benefits of residential sprinklers. A key group advising USFA was the Residential and Light Hazard Sprinkler Subcommittee (13D) of the NFPA. It became a matter of concern that subcommittee discussions in two areas were vulnerable to serious misunderstanding:

1. the USFA estimate that residential property losses would be reduced 60 to 80 percent by sprinklers
2. the assumption that substantial insurance incentives would follow without question

Without speaking to the accuracy, or possible inaccuracy of the above items, 13D members were advised that public discussion of these items could lead to problems because:

a. there would inevitably be a media misunderstanding resulting in a statement about a 60 to 80 percent insurance saving

b. even those people aware of the multi-peril nature of a homeowners policy are not likely to know that the fire and lightning (F&L) portion of their policy may account for only 35 to 40 percent of the total homeowner premium

c. few people understand that claim expenses for a fire loss include smoke damage, water damage, additional living expenses, fixed claim expenses and a number of other items in addition to direct fire damage

Insurance companies prefer to develop rates based on experience with a large number of risks.

Lacking a large body of real world experience, a closely controlled set of comparison tests might give insurance companies something on which to base underwriting judgement regarding whether a discount was indicated. Such tests might also give some guidance on the size of any such discount.

FORMATION OF THE AD HOC COMMITTEE ON RESIDENTIAL SPRINKLERS

At the request of USFA, an ad hoc insurance committee was created to design, oversee and help conduct matched fire tests, with and without sprinklers. The committee was created with the assistance of the Alliance of American Insurers, the American Insurance Association and the National Association of Independent Insurers. Each trade association provided several committee members from their client companies and a member from their staff. Also, at their suggestion, members were added from the Insurance Services Office, Schirmer Engineering Corp., Tech Cor and GAB Business Services.

NEED FOR A NEW STANDARD

Since the existing NFPA standard on residential sprinklers (13D) was approved in 1975, no significant number of residential sprinkler installations has been made. It is the concensus of those concerned with the problem that the expense of meeting that standard was a major problem.

The sprinkler system installed at the L.A. test site meets a proposed new standard scheduled for consideration and approval at the NFPA November, 1980 Conference. Anyone wishing to review the 1975 13D or the proposed 1980 Standard may order a copy from:

National Fire Protection Association
470 Atlantic Avenue
Boston, MA 02210
617 + 482-8755

Since 1977, the Insurance Services Office (ISO) has had filings in many states providing a 5 (five) percent discount on a homeowner policy covering a dwelling with an approved and properly maintained sprinkler system that covers all areas of the insured structure. Their filings also allow a 2 (two) percent discount for a similar system that omits specified areas such as closets, attics and bathrooms.

There is considerable interest in the establishment of larger discounts, particularly as an incentive to sprinkler installation. While a significant discount would no doubt serve as an incentive, rate reductions need to be justified in terms of lowered risk. Before such a move can be reasonably considered, it is necessary that a standard exist for reference in filings.

AD HOC INSURANCE INDUSTRY COMMITTEE ON RESIDENTIAL SPRINKLERS

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Ralph J. Jackson, Chairman
Loss Prevention Manager
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MISSION OF THE AD HOC COMMITTEE

- to cooperate with the U.S. Fire Administration and its test team to design and conduct a limited number of matched-fire tests to investigate the property loss reduction potential of residential sprinklers installed in accordance with the standards used at the Los Angeles test site

- to make the results of the comparison tests available to the insurance industry and other interested parties

Committee Observations

Based on the results of the comparison tests it was the observation of the ad hoc committee that sprinkler systems installed according to the standard used in the Los Angeles comparison tests definitely have the ability to reduce claim payment expenses. The committee further noted that the early ISO discount (1977) is less than what seems to be indicated by the 1980 tests.

Recommendation

That those corporate and association people with rate making responsibilities review this information with the intention of making their own determinations of what discount might be indicated by sprinkler systems installed to the specifications used at the Los Angeles test site.

FIRE DEPARTMENT NOTIFICATION

In order to achieve a near normal fire department response, the suppression personnel were not briefed on the nature or location of the fire within the test house. Their instructions were to treat the test house just as they would treat any call. They were simply to deal with the fire and overhaul according to normal procedures. They were aware, however, that the structure was unoccupied and therefore a search for possible occupants was unnecessary. As a result, fire suppression operations were started immediately upon arrival. Normal shift rotations during the several weeks of the test fires tended to eliminate the factor of firefighter familiarity with the test site.

The notification procedure for unsprinklered fires was: When smoke or flames were first visible enough for notice by pedestrians or passing drivers, there was a five minute wait to simulate gaining access to a phone and reaching the fire department. Two minutes after the notification call the first piece of equipment arrived at the first scene.

In the sprinklered tests, although all evidence of fire was gone by the third minute of each fire, the sprinklers were allowed to operate for ten minutes to simulate notification and response time. The sprinklers were then shut off manually and any necessary overhaul performed. Operating this way also met the ten minute water supply demand required by 13D.

The two minute response time is better than could be expected in most instances. This and other factors that may have affected the extent of fire damage and the amount of water used are mentioned under the heading, "Factors Tending To Affect Damage In Comparison Fire Tests."

FACTORS TENDING TO AFFECT DAMAGE IN COMPARISON FIRE TESTS

> Note: While it is not true in every instance, generally, the longer a fire remains undetected, the greater the supression challenge, the greater the damage and the greater the amount of water needed to suppress the fire.

1. The training, equipment and manpower availability of the Los Angeles Fire Department enabled a suppression response such as would be expected from a department that is among the best in the country. Any factor making the suppression response less prompt or less effective could be expected to result in more extensive damage.

2. The responding companies did know that the structure was unoccupied and were able to attack the fires without delay.

3. All test fires took place during daytime. This may have contributed to the speed with which the firefighters could move about the scene.

4. All tests took place during good weather. Rain, snow accumulation or below-freezing temperatures could have tended to slow movement at the fire scene. This is particularly true of activities on the roof.

5. In all fires, prompt notification was a factor. Had notification for the sprinkler tests been delayed, greater water damage could have been experienced. Later notification for the non-sprinklered fires would most likely have resulted in more extensive fire damage and an increased amount of water used in extinguishment.

Late notification for the sprinklered fire, however, would not be expected to result in significantly different damage unless the period of sprinkler operation extended on the order of thirty minutes or more.

6. All fires were unventilated prior to suppression team arrival. This probably tended to be a factor in the fires, e.g., bedroom tests, where a great amount of smoke was generated.

SPECIAL CONSIDERATIONS FOR SPRINKLERED DWELLINGS

1. All sprinklered fires in the comparison tests took place in rooms having sprinklers. Greater damage would have been expected if the fire took place in an unsprinklered area such as a closet, attic or storage room.

2. Good weather eliminated the possibility that any of the sprinklers would fail to operate because of freezing.

3. The sprinkler system was recently installed and well maintained. In the real world, industrial experience indicates that a percentage of malfunctions must be expected due to closed valves and inadequate maintenance. It is likely that inspection and maintenance on residential sprinklers will occur with less frequency than industrial installations. This, too, could be a factor.

   If there is a single water service from the street, however, it would not be possible to shut down the sprinkler system without also cutting off the regular residential water supply.

4. The sprinkler activations reported here were all the result of fires. In considering the long term use of sprinklers, malicious activation and leakage caused by freezing must all be taken into account. The industrial sprinkler experience has been very favorable with regard to accidental activation. This may provide some guidance.

OTHER FACTORS

The house was furnished with less furniture than might be expected for its size. The quality of the furnishings was on the low side. Because the set-ups were the same for all fires, this was not considered to be a significant factor.

The furniture used in the comparison tests was of the sort currently available in most parts of the country. Had the furniture met the flammability standards of the State of California, the cigarette fires might have never reached the open flame stage.

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CLAIM PAYMENT ESTIMATES

The Jury

To ensure the acceptability of the claim payment estimates, it was decided that a jury of three experienced claim representatives would serve as a team for each fire event. Most adjusters took part in two fire events; some took part in more than two. A representative of the Insurance Services Office also took part as an observer.

GAB Business Services, Inc. assigned their Los Angeles Regional Office General Adjuster William Orr who served as coordinator and lead adjuster on all the comparison fires. In addition to scheduling the other team members, the coordinator developed a set of data recording forms to aid the team members in following a uniform pattern.

Damaged household items were replaced prior to subsequent fire tests. This was necessary to demonstrate that an item's post-fire condition was not due to exposure in a previous test. For example, following the kitchen (sprinklered) fire, the refrigerator was replaced even though it appeared that simply cleaning it would have restored the pre-fire condition. When it was necessary to replace the refrigerator after the non-sprinkler kitchen fire, there was no question that the damage was all the result of the second fire.

Because of wide regional variations in the cost of ALE (additional living expenses), the committee chose $150 a day for a family of five (two adults, three children including both male and female). The weekly ALE was seven times the daily expense and the monthly amount, 30.4 times the daily expense.

The following companies donated the cooperation of their representatives for service on the adjusting juries that estimated the claim payment expenses for each fire:

Allstate Insurance Company - Frank Wheeler
Firemen's Fund Insurance Company - Denise Dimin
GAB Business Services, Inc. - Wm. Orr (coordinator)
GEICO - Marty Schwebel
INA (2) - Paul Thurston and Jeffory Weiss
Insurance Services Office - Orville Sherman (observer)
The Kemper Group - Keith Vint
State Farm Insurance Company (2) - Larry Sprogins &
Jeffery M. Sprogins

CLAIM PAYMENT EXPENSE

Comparison summary

	Kitchen	Livingroom	Bedroom	Average
non-sprinkler	$35,245	$34,110	$8,650	$26,002
sprinkler	$ 3,364	$ 8,617	$6,250	$ 6,077
ratio*	10½:1	4:1	1½:1	4¼:1

*non-sprinkler damage
sprinkler damage

For ease of review, the following fire scene damage reports have been summarized. Those needing detail or clarification should write to:

Ralph J. Jackson
Allstate Plaza F-3
Northbrook, IL 60062

LIVINGROOM

Sprinklered narrative

A cigarette was placed under a throw pillow on an upholstered couch. There was considerable smoke buildup throughout the room preceeding flame and heat sufficient to activate a sprinkler. One sprinkler opened and extinguished the fire. The water supply specifications in this test, as in all L.A. site fires, called for the first sprinkler to deliver 18 gallons per minutes.

Observers indicated the fire was extinguished before the end of the third minute sprinkler activation. At that point, 54 gallons of water had been released by the sprinkler. The sprinkler was allowed to operate a total of ten minutes and apply a total of 180 gallons (10 x 18) to simulate the five minute notification time and the two minute response period used in all the tests. The sprinkler system was then turned off manually.

Estimated claim payment of $8,617 includes $1,050 of additional living expenses.

Non-sprinklered narrative

As in the sprinklered fire, a cigarette was placed under a throw pillow on an upholstered couch. There was considerable smoke buildup for about an hour. At approximately an hour and twelve minutes a small flame was visible. At that time the flame grew rapidly and in less than ten additional minutes the flames were visible from the street. After a five minute wait to simulate location of a phone and notification of the fire department, the equipment was called in. They made a two minute response and extinguished the fire using 80 gallons of water.

Estimated claim payment of $34,110 includes $9,120 (two months) of additional living expenses.

LIVINGROOM

	SPRINKLER	NON-SPRINKLER
Lower level	AMOUNT in dollars	AMOUNT in dollars
study	491	540
bath	352	375
rumpus room	0	0
Mid-level		
living room	2,767	6,947
den	329	333
entry	56	326
diningroom	245	630
kitchen	141	517
breakfast room	53	48
bath	77	77
service (utility) room	69	69
Stairs	118	513
Upper level		
hall area	79	483
bedroom 1	510	3,272
closet 1	67	102
master bath	66	66
bedroom 2	444	2,804
closet 2	36	53
bedroom 3	315	1,692
closet 3	46	53
hall bath	86	86
Exterior	0	2,406
Misc.	1,220	3,973
ALE	1,050	9,120
Total	8,617	34,110
Gallons of water used =	180	80

BEDROOM 2

Sprinklered narrative

A wastebasket of crumpled newspaper placed between the bed and nightstand was ignited with a match. After the paper flame subsided, the mattress smoldered and generated considerable smoke. The mattress finally broke into open flame and activated a sprinkler. This single sprinkler extinguished the fire.

Observers indicated the fire extinguished before the end of the third minute from sprinkler activation. At that point 54 gallons of water had been released by the sprinkler. The sprinkler was allowed to operate a total of ten minutes and apply a total of 180 gallons to simulate the five minute notification time and the two minute response period used in all the tests. The sprinkler system was then turned off manually.

Estimated claim payment of $6,520 included one week of additional living expenses ($1,050).

Non-sprinklered narrative

A wastebasket of crumpled newspaper placed between the bed and the nightstand was ignited with a match. After the paper flame died down, the mattress flamed for a while producing a considerable amount of smoke. Heat and smoke continued to build but lack of ventilation and heavy smoke appeared to limit the amount of flame damage. Lack of flaming also tends to explain the small amount of water needed for suppression. Six and a half gallons of water were used.

Estimated claim payment of $8,650 included two weeks of additional living expenses ($2,100).

BEDROOM 2

	SPRINKLER	NON-SPRINKLER
Lower level	AMOUNT in dollars	AMOUNT in dollars
study	0	0
bath	0	0
rumpus room	0	0
Mid-level		
living room	0	80
den	665	0
entry	0	0
diningroom	0	0
kitchen	0	0
breakfast room	0	0
bath	145	0
service (utility) room	152	0
Stairs	183	183
Upper level		
hall area	79	79
bedroom 1	1,089	630
closet 1	102	64
master bath	66	66
bedroom 2	1,969	3,566
closet 2	53	53
bedroom 3	315	315
closet 3	46	46
hall bath	90	90
Exterior	0	533
Misc.	516	845
ALE	1,050	2,100
Total	6,520	8,650
Gallons of water used =	180	6½

KITCHEN

Sprinklered narrative

The source of ignition was an electric coffee maker with the thermal limit switch bypassed. The continuous heating produced smoke and flame. As the plastic body melted, the fire transmitted to the overhead cabinets. The melted, flaming plastic damaged the counter top and some of the flaming puddle ran down the side of the base cabinet and burned a small area of the floor covering. At this point the heat was sufficient to activate a sprinkler. This single sprinkler extinguished the fire.

Observers indicated the fire was extinguished before the end of the third minute from sprinkler activation. At that point, 54 gallons of water had been released by the sprinkler. The sprinkler was allowed to operate a total of ten minutes and apply a total of 180 gallons to simulate the five minute notification time and the two minute response period used in all the tests. The sprinkler system was then turned off manually.

Estimated claim payment was $3,364. No additional living expense was provided as the house could be used after a brief cleanup activity.

Non-sprinklered narrative

The ignition source and fire pattern was identical to the sprinklered kitchen fire except that the fire continued to build considerable flame and smoke. The buildup was rapid and at the point where the smoke could be seen from the street, the fire department was notified after the five minute wait to simulate locating a phone and giving the necessary information. The fire department made a two minute response.

Smoke buildup was so severe by the time the fire department arrived that the fire appeared to be in the upper level of the house. This, plus normal fire suppression precaution in checking the room above the source of the fire contributed to the damage on the upper level.

670 gallons of water were used to suppress this fire.

Estimated claim payment was $35,245 and included two months ($9,120) of additional living expenses.

KITCHEN

	SPRINKLER	NON-SPRINKLER
Lower level	AMOUNT in dollars	AMOUNT in dollars
study	0	0
bath	0	0
rumpus room	637	1,031
Mid-level		
living room	50	1,399
den	0	321
entry	incl	357
diningroom	594	2,325
kitchen	1,203	6,167
breakfast room	190	934
bath	0	77
service (utility) room	0	69
Stairs	0	183
Upper level		
hall area	0	155
bedroom 1	0	2,771
closet 1	0	111
master bath	0	66
bedroom 2	0	2,939
closet 2	0	53
bedroom 3	0	1,692
closet 3	0	46
hall bath	0	86
Exterior	0	1,601
Misc.	690	3,742
ALE	none	9,120
Total	3,364	35,245
Gallons of water used =	180	670

APPENDIX

HARDWARE RELIABILITY

Some concern has been expressed regarding the reliability of the proposed hardware, specifically its potential for leakage and accidental activation.

Knowing that high reliability would be a key factor to acceptance, the U.S. Fire Administration let a contract bringing the resources of both Factory Mutual Systems and Underwriters Laboratories to bear on a proposed performance standard. The items listed below were extracted from drafts presented in April of 1980 by FM and UL. While those were early drafts, they indicate the severity of the tests recommended. The few items selected for demonstration are by no means complete and perhaps not among the most significant parts of the proposed performance standards.

(Excerpts from 31 pages & appendix of the draft standard)

5.3 **Leakage** - To verify compliance to paragraph 4.3, at least twenty residential sprinklers are to be individually filled with water and subjected to a slowly rising hydrostatic pressure. The pressure is to be increased to 500 psi (3447 kPa) at a rate not to exceed 300 psi (3068 kPa) per minute and held for one minute. During this phase there shall be no weepage or leakage.

5.4 **Hydrostatic Strength** - If all samples comply with the requirements of paragraph 4.3, each sample is to be further subjected to an increasing hydrostatic pressure up to 70 psi (4826 kPa) at a rate not to exceed 300 psi (2068 kPa) per minute. If during this test leakage becomes evident, the pressure at which it was observed will be recorded. The test is then to be continued up to 700 psi (4826 kPa), if possible, and held for one minute. The sprinkler shall not rupture.

5.5 **30 Day Leakage** - To verify compliance to paragraph 4.5, five previously untested sprinklers are to be installed on a water-filled test line which is to be maintained under a constant pressure of 300 psi (2068 kPa) for 30 days. The samples are to be examined weekly during the test period for evidence of leakage of water at the seal. Following satisfactory completion of this 30 day test period, the samples are to be tested to determine the weep and leak points. The samples are then to be examined for any evidence of distortion or physical damage.

5.6 **Water Hammer** - To verify compliance to paragraph 4.6, five previously untested samples are to be installed on a water filled test line and subjected to changes in pressure from 50 to 500 psi (345 to 3447 kPa) at 60 cycles of pressure change per minute. The test piping is to be filled so that there is water at the sprinkler seat. Observations are to be made for evidence of water hammer, the samples are to be hydrostatic tested to determine that the weep and leak points are in excess of 500 psi (3447 kPa). The samples are then to be examined for any evidence of distortion or physical damage.

HARDWARE RELIABILITY, continued

5.17 Vibration

5.17.1 Compliance to the requirement as stated in paragraph 4.17 shall be determined by subjecting a minimum of four residential sprinklers to a vibration of 0.02 in. (0.5 mm) amplitude at a varying frequency ranging from 10 to 35 Hz for a period of 5 hours. If one or more resonant point(s) can clearly be detected, the sprinklers will be vibrated at such frequency (frequencies) for proportionate periods of the remaining 115 hours of the test. If no resonant frequency is detected, then the sprinklers are to be vibrated at an amplitude of 0.02 in. (0.5 mm) and a frequency of 35 Hz for a period of 115 hours.

5.17.2 For this test the sprinklers are to be attached to a steel mounting plate and the plate bolted to the table of a vibration machine so that the sprinklers are mounted vertically. The test sprinklers are then to be vibrated in the vertical direction.

5.17.3 This test is to be conducted with the sprinklers unpressurized.

5.17.4 For these test, amplitude is defined as the maximum displacement of sinusoidal motion from position of rest to one-half of the total table displacement.

5.17.5 Following the vibration test, the sprinklers shall not weep or leak at or below 500 psi (3447 kPa) and shall operate normally when subjected to the sensitivity test, see paragraph 4.20.

5.18 Rough Usage

5.18.1 Compliance to Paragraph 4.18 shall be determined by individually placing one out of every four sprinklers to be tested in a drum containing 20 blocks of wood and tumbled for a period of one minute.

5.18.2 The drum, or any suitable container, should be so designed as to provide a tumbling action.

5.18.3 The blocks shall be 1½ in. (38.1 mm) cubes made of hardwood (i.e. oak, maple, etc.).

5.18.4 Following tumbling, they are to be tested for conformance with the requirements for leakage (see paragraph 4.3). After being tested for leakage, each sprinkler shall be tested for conformance with the requirements for sensitivity (see paragraph 4.20)

The above examples demonstrate that the performance requirements for residential sprinkler components will significantly exceed those of normal household plumbing fixtures and fittings.

Underwriters Laboratories is presently ready to conduct performance tests on residential sprinklers submitted for listing.

RESIDENTIAL SPRINKLER TEST FIRES

Comments from Harry Shaw, U.S. Fire Administration

Technological Advance

The residential sprinklers developed for use in the Los Angeles fire tests represent a major technological breakthrough. The sprinklers were developed by Grinnell Fire Protection Systems and used in the tests by the Los Angeles Fire Department under the sponsorship of the U.S. Fire Administration. Prior to the development and use of these sprinklers the fastest time constant of an approved and listed sprinkler was in the order of 110 seconds at five foot per second gas velocity. The slowest time constant was approximately 300 seconds. The new sprinkler used in the L.A. tests was five to 15 times faster than the sprinklers used in approved residential sprinkler installations meeting the current standard. The improved sensing is considered to be the primary reason for the success of the sprinkler system in the L.A. fire test series.

Another characteristic of the new sprinkler is the improved water distribution pattern. Further distribution pattern improvements are expected. The improved distribution provides adequate cooling and reduces the probable actuation of second and third sprinklers. Such actuation could greatly reduce the effectiveness of the system.

Further Developments

One of the more recent developments for residential sprinklers is the on-off feature. After the Los Angeles tests were concluded an on-off sprinkler* was submitted to the Factory Mutual Research Corporation for evaluation and testing. The performance of this sprinkler, as indicated by the Factory Mutual tests, was encouraging, however, additional tests and evaluation are necessary.

Another development may result from a research and development program with the Battelle Memorial Research Laboratories under the sponsorship of the U.S. Fire Administration. Battelle will investigate the use of Nitinol as a sensing element. Nitinol (a nickel titanium alloy) makes a sensor which will convert heat energy into mechanical energy. The objective of the R&D support is to develop a more effective and reliable sensor actuator for residential sprinkler systems.

* the on-off sprinkler will stop the flow of water when the temperature indicates sprinkler operation is no longer needed. In the event of a re-kindle, the sprinkler would turn on again when the temperature reached the activation level.

H. Shaw comments, continued

Mobile Home Sprinkler Tests

The first test of the North Carolina Mobile Home Sprinkler Program was conducted August 27, 1980 in Charlotte, NC with the help of the Charlotte Fire Department. The tests are under the sponsorship of the U.S. Fire Administration with NFPA as the program manager and McNeary Insurance Consulting Services providing site management. Technical support was provided by the Factory Mutual Research Corporation.

The Los Angeles and Charlotte tests were necessary as support for the proposed 1980 revision of the NFPA 13D Residential Sprinkler Standard scheduled for consideration at the November meeting of NFPA in San Diego, CA.

While the results of the 16 mobile home test fires are still being analyzed, the reaction of the test team was that the sprinkler system met and exceeded their life-safety expectations. Since all 16 sprinklered fires took place in the same mobile home unit, the team felt this gave strong indication of the property loss reduction potential of sprinklers. According to the test team, sprinkler activation limited the mobile home property damage to furniture, drapes and moderate scorching in the area of origin.

A full report on the Charlotte tests will be available later through the U.S. Fire Administration.

Senator SARBANES. Thank you very much.

Mr. Bryan, please proceed.

STATEMENT OF JOHN L. BRYAN, PROFESSOR AND CHAIRMAN, DEPARTMENT OF FIRE PROTECTION ENGINEERING, THE UNIVERSITY OF MARYLAND

Mr. BRYAN. Senator, I want to thank you for the opportunity to appear here this morning. I want to go through my prepared statement and just highlight what I feel to be the essential points.

The first thing I want to emphasize is that this is my personal statement and the opinions, concepts, and assumptions should not be in any way attributed to the university or any other professional organization that I belong to. Most of those professional organizations have had their own representatives here this morning.

On your question relative to the increased costs from the reduction in Federal support, I want to emphasize, as has already been mentioned here, that these programs under the U.S. Fire Administration, the Center for Fire Research, and the National Fire Academy have never been funded by the Congress at their recommended or authorized levels.

So from the very beginning, these efforts have been working at a reduced level. From that very excellent report of "America Burning," the recommended Federal support has never appeared.

So now what we're trying to do is salvage the very little bit that's been continually reduced.

What would be the most severe effect of further reductions? I think it's to the attitudes and the morale of the dedicated local and State fire officials that you've heard from today. These reductions send a signal to these individuals and their organizations that regardless of what they've accomplished in the past decade, as shown here and as has been referred to by the speakers, that this is not a national problem as perceived by the Federal Administration and our Federal Congress.

So it's a morale and attitude problem.

Second, I think, the point you raised earlier, it implies a demonstrated unworthiness of these programs which affects your local and State funding for these programs as it now exists and makes the creation of more fights to maintain your level of funding at those areas because you have to try and counter the argument, well, if it's not important for the Federal Government, why is it important for the State and local governments?

The appropriate Federal role, I believe, in fire safety and fire research should be to provide educational and technical support with the development of pilot programs for State and local governments, essentially, the recommendations of the National Commission on Fire Prevention and Control presented in 1973, 13 years ago.

The technical support has been developed through the Center for Fire Research. They've developed basic research necessary for initial understanding of fire ignition and propagation, development of computer simulation and prediction of these characteristics has been achieved. These programs are now being disseminated to the designers of buildings by fire protection engineers to predict fire effects within a specific building configuration and design.

We've had the technical support from the U.S. Fire Administration, as you saw outside, with the quick-response residential sprinkler head. Other speakers mentioned the fire projects for improved protective clothing and breathing apparatus for firefighters. And there has been much private sector development out of the residential sprinkler head, as Mr. Jackson just mentioned.

Right now, under the National Fire Protection Research Foundation, there's been developed the early suppression, fast-response automatic sprinkler, which is a commercial, industrial adaptation of the residential quick-response head, which is probably going to revolutionize the entire sprinkler design for commercial and industrial properties, including high-rise hazards.

The National Fire Academy has supported and developed educational programs, as you've heard, for the development, most importantly, of fire prevention officers and fire marshals. Remember, "America Burning" emphasized the development of fire departments into fire prevention organizations and as a result of this training and their conferences, the National Fire Protection Association recognized the interest of these personnel with the formation several years ago of the Public Fire Educators Section. This section meets semiannually now and exchanges ideas and concepts, all as an outgrowth of the National Fire Academy's work.

What are the needed funding levels and suggested improvements? First off, I strongly believe we'll never have an effective, efficient U.S. Fire Administration or National Fire Academy until we separate the agency from the Federal Emergency Management Agency into a separate agency, as they were created prior to 1979. The National Fire Academy and the U.S. Fire Administration have suffered irreplaceable losses in qualified personnel—I mean outstanding people have taken retirement or left because of the continued threat of zerofunding—the lack of adequate leadership, as you mentioned earlier, while under FEMA.

The Federal Emergency Management Agency is staffed with ex-military personnel. They've never understood the continuing fire problem in the United States and the need for Federal support of fire research, fire safety, and fire prevention.

In essence, they're planning and dealing with large-scale disasters and possible disasters while the fire service has to answer the immediate, everyday needs of the citizens who have personal and local emergencies throughout the United States.

As I was getting ready to leave to come up here this morning, the fire apparatus arrived at my office at the university. This is a continuing example of the need that the fire service answers. It's not a large disaster that occurs six times a year or may occur once in our lifetime. It's the emergency that occurs daily.

We're talking about response from the fire service in seconds and minutes and FEMA talks about responding in hours and days and weeks.

The two are not compatible. It was a political marriage and, unfortunately, it's time for a divorce.

In relation to the support of fire research by the Federal Government, when one looks at the expenditures for fire research, the United States is the lowest in expenditures when compared with

Japan, which was referred to earlier, Sweden, Finland, the United Kingdom, Norway, Denmark, and the Netherlands.

The Conference on National Fire Research Strategy in 1984 indicated the Center for Fire Research is essentially the only agency supporting basic fire research. I've given some numbers as a minimum figure that I believe need to be added to the National Fire Academy of $20 million, the U.S. Fire Administration, $22 million, and the Center for Fire Research of $20 million, to do their jobs as originally carried out in the mandate from "America Burning." That would be the minimum to carry out their effective jobs and possibly to retain and attract back to them effective personnel.

I've indicated a lot of minor specific suggestions for the programs at the National Fire Academy, the U.S. Fire Administration, and the Center for Fire Research.

Finally, I would like to say that what's really needed, as I indicated, is back to a separate agency where they have their own management. They are responsible directly to their funding agency, Congress, and thus given adequate funding and recognized permanence, getting rid of this continual threat, the Center for Fire Research, the U.S. Fire Administration, and the National Fire Academy can again attract the needed educated and capable personnel to fulfill their originally mandated missions.

In essence, the Federal Government created these organizations to do a job, funded them inadequately and has continually, by placing them into an unsympathetic agency, hampered their fulfilling the mandate they gave to them.

I'll be glad to answer any questions.

[The prepared statement of Mr. Bryan follows:]

PREPARED STATEMENT OF JOHN L. BRYAN

PREFACE

This statement should be understood to be the opinions, concerns and assumptions of the author and should not in anyway be attributed to the University of Maryland or any other professional organization affiliated with the author.

INTRODUCTION

This statement will be directed to the following three questions of concern to The Joint Committee: 1- The economic and social costs of the reduction in Federal support for fire prevention, research, and safety? 2- The appropriate Federal role in fire safety, research, and prevention? 3- To achieve an appropriate Federal role in these areas, what level of Federal funding and program resources would be needed? What improvements can be made in Federal programs that support the efforts of state and local governments?

THE COSTS OF FEDERAL SUPPORT REDUCTIONS

It should be recognized the existing Federal programs consisting of the U.S. Fire Administration, The Center for Fire Research and the National Fire Academy have never been funded at their recommended (8) or Authorized levels (6,2). Therefore, from their very inception, these programs have been operated with funding resources inadequate for their assigned responsibilities. Thus, the reduction of these Federal programs in personnel or funds would probably not result in an immediate change in the life and property loss from fire in the United States in 1987.

However, upon examining the economic and social costs of reducing the existing limited federal support over the forthcoming decade, there would undoubtly be a disastrous loss of research momentum, educational efficiency, and fire prevention effectiveness. Probably, the most severe effect would occur to the attitudes and morale of the currently dedicated local and state fire officials respresented in this assembly today. Federal funding reductions send a signal to these individuals, that regardless of their demonstrated results in reducing the fire losses over the past decade, the fire costs and losses they experience in their communities are not perceived as a national problem.

Thus, the development of improvements and creativeness in fire prevention accomplishments over the past decade would be lost. The emerging emphasis in local and state organizations on fire prevention programs and education would be stagnated. The fire research initiatives in the areas of fire hazard and toxicity assessment, computer simulation and prediction, and basic fire phenomenon would be severely restricted or completely curtailed.

Over the forthcoming decade there would obviously be a recognizable significant increase in both the frequency and severity of fires, with a resulting increase in the human fatalities and injuries. However, one of the most significant costs from a reduction of Federal funding for fire safety would be the implied and demonstrated unworthiness of fire research, fire prevention and fire safety programs for Federal funding. This conceptualization would have very adverse implications for the continuity of private sector support and state or local government funding of activities involving fire research, fire prevention or fire protection education and training.

THE APPROPRIATE FEDERAL ROLE

The Federal role in fire safety, fire research and fire prevention should be to provide educational and technical support with the development of pilot programs for the states and local governments. Essentially, the recommendations of The National Commission on Fire Prevention and Control presented to The Congress of the United States thirteen years ago, in 1973 (8).

The technical support has been developed through the fire research projects at the Center for Fire Research of the National Bureau of Standards. The basic research necessary for an initial understanding of the primary characteristics of fire ignition and propagation within a compartment and the development of computer simulation and prediction of these characteristics has been achieved (5,10). These computerized programs are now being adapted and utilized by fire protection engineers and designers in predicting the fire effects within a specific building configuration (11).

Applied technical support has been provided by the U.S. Fire Administration with the development of improved protective clothing and breathing apparatus for fire fighters, and the development of the quick response residential automatic sprinkler head. This Federally supported research effort has provided the basis and emphasis for the private sector development of Underwriters Laboratories and Factory Mutual approved plastic pipe for automatic sprinkler systems in the residential type of occupancies (1,3). This Federal research project also provided the basic sprinkler head and the design concept for the privately supported National Fire Protection Research Foundation project for the development of an early suppression fast response (ESFR) automatic sprinkler head (3,4). This automatic sprinkler head, now being developed and listed, may significantly improve the effectivness of automatic sprinkler systems in commercial and industrial properties.

The Federal role in fire prevention has been supported from both the U.S. Fire Administration and the National Fire Academy. The Fire Administration has developed and presented effective conferences for the interchange of successful concepts and techniques related to fire prevention in local communities. This communicative support was extended with the use of a fire prevention exchange newsletter.

The National Fire Academy has supported and developed educational programs for the professional development and education of fire prevention officers and fire marshals. The Open Learning Fire Service Program, established and funded by the National Fire Academy has provided an efficient and effective means for fire service and fire prevention personnel to complete their baccalaureate degrees in fire related education programs throughout the United States.

These efforts have developed a cadre of highly technical and academically educated personnel in both volunteer and career fire departments with sole responsibility for fire prevention education. The National Fire Protection Association recognized the professional interests of these personnel with the formation of the Public Fire Educators section.

Thus, the Federal fire research and fire prevention efforts for the support of local and state government agencies has been well established and has resulted in significant accomplishments over the past decade.

NEEDED FUNDING LEVEL AND SUGGESTED IMPROVEMENTS

To achieve an efficient and effective Federal support program to local and state governments for fire safety, fire research and fire prevention, the U.S. Fire Administration and the National Fire Academy should be separated from the Federal Emergency Management Agency into a separate agency as they were prior to 1979 (6). Both the National Fire Academy and the U.S. Fire Administration have suffered irreplaceable losses in qualified personnel and needed funding while in FEMA. The Federal Emergency Management Agency is an organization primarily staffed with exmilitary personnel, who have never understood the parameters of the continuing fire problem in the United States and the need for Federal support of fire research, fire safety and fire prevention.

The federal funding levels should be restored to the levels initially recommended by the National Commission on Fire Prevention and Control (8) with a minimum of $20,000,000 for the National Fire Academy and $22,000,000 for the U.S. Fire Administration.

In relation to the support of fire research by the Federal Government, when one examines the expenditures for fire research, the United States is the lowest when compared with Japan, Sweden, Finland, United Kingdom, Norway, Denmark and the Netherlands. As indicated by the conference on a National Fire Research Strategy in 1984, the Center for Fire Research is essentially the only agency supporting basic fire research.(9) It would appear a minimum appropriation of $10,000,000 would be needed to provide an effective fire research program.

When one examines the accomplishments of the past five years from the Center for Fire Research, the U.S. Fire Administration and the National Fire Academy while under the continued threat of zero funding, with reduced funding and a resultant loss of critical personnel it is truly remarkable: Smoke detectors are an acceptable fixture in 75 percent of the residences; Toxicity and fire hazard assessment protocols have been developed; Computerized simulation and prediction programs have been distributed; Fire service personnel are completing training courses at the National Fire Academy in record numbers, and the Open Learning Fire Service Program had approximately 1,400 fire service personnel enrolled in academic studies toward baccalaureate degrees at eight institutions of higher education in 1985-86.

The following suggestions might improve the efficiency and effectiveness of the U.S. Fire Administration, the National Fire Academy, and the Center for Fire Research:

1. As previously indicated, the greatest improvement could be achieved with the separation of the U.S. Fire Administration and the National Fire Academy from the Federal Emergency Management Agency into an autonomous agency.

2. Additional programs should be initiated in the Center for Fire Research to facilitate the transfer of the research results and technological developments in fire research to the local and state agencies more expeditiously, with a format as demonstrated at the National Fire Research Strategy Conference (7).

3. Courses should be initiated at the National Fire Academy in the previously neglected areas of: Fire research accomplishments, human behavior in fires, the evaluation of fire prevention, and the applications of artifical intelligence.

4. The transfer of fire prevention techniques, procedures and knowledge should continue to be emphasized in every resident and outreach program of the National Fire Academy.

5. A greater emphasis in terms of personnel and funding should be provided to the outreach programs of the National Fire Academy until this effort is equivalent to the resident programs.

6. Additional faculty and staff at the National Fire Academy should be selected with qualified educational as well as fire service prerequisites.

7. The fire suppression priorities of existing courses at the National Fire Academy should be balanced with fire prevention and administration-management courses.

8. Improved coordination and cooperation should be initiated by the National Fire Academy with the existing academic programs in fire related education at both the local and state level, as is currently achieved with the Open Learning Fire Service Program affiliated institutions.

9. The National Fire Academy should initiate a program of matching grants and educational loans to enable academically qualified fire service and fire prevention personnel to obtain baccalaureate or graduate degrees in fire related education programs from local or state institutions.

10. The grants and contracts awarded by the U.S. Fire Administration to local or state organizations should emphasize fire research, technology transfer and fire prevention.

11. The programs of research in the Center for Fire Research should be expanded to include the undeveloped areas of: Operations and systems research, human behavior, fire prevention analysis, and artifical intelligence.

12. More permanence must be provided to all three agencies by removal of the annual threats to their existence, which have plagued them for the past five years, and created a critical drain of both personnel and economic resources.

In summary, the removal of the U.S. Fire Administration and the National Fire Academy from the disinterested and ineffective administration of FEMA is essential for the needed Federal continuity and improvement of fire prevention and safety in the United States. Given adequate funding and recognized permanence, the Center for Fire Research, The U.S. Fire Administration and the National Fire Academy should again be able to attract the needed educated and capable personnel to fulfill their originally mandated missions (8).

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Senator **Sarbanes**. Thank you very much, Mr. Bryan. It's a very helpful statement and we may come back to some of those specific recommendations that you listed. But first, I think we'll hear from Mr. Berl.

STATEMENT OF WALTER G. BERL, MEMBER, PRINCIPAL STAFF, APPLIED PHYSICS LABORATORY, THE JOHNS HOPKINS UNIVERSITY

Mr. **Berl**. Well, I have the unenviable position of being the last one in line. Everything that I had planned to say has been said and lunchtime is approaching fast.

I've turned in a prepared statement which is much too long to read in detail. I'd like to summarize some thoughts and hope that you'll ask questions afterwards.

I've grown old enough now to have seen the development and what may well be the demise of a fire program in the United States. Shirtsleeves to shirtsleeves, it used to take three generations. Now it seems only to take half a generation. In less than 10 years, funding that was very small or zero has risen and has now gone back officially to zero once again.

There's a Murphy's law which says that anything that can go wrong will go wrong. There's a corollary to this which says anything that can burn will burn. We, in the last year or two, have seen two new wrinkles to this statement. One is the disaster in the Soviet Union, where a nuclear reactor burned. We've seen the *Challenger* disintegrate as an unwanted result of a fire. And we have not yet seen, but we may see, nuclear winter, another fire problem, on a scale beyond anything that people have had experience with, and when it happens, it leaves the fire departments, which are supposed to respond to Chernobyl, wondering what to do next.

So the country, and the world, as such, has gone through this development of a number of acute cases beyond the imagination of people working in the day-by-day problem areas, but not so remote that one could not have done some preliminary work and preparations for them.

In addition, one is confronted by the chronic problem of fires which go back, way back, and which are unfortunately so familiar to us all, that one takes them very lightly. And somebody mentioned early on the fire losses in this country are the equivalent of the Vietnam losses per year.

It's so chronic, that we've become accustomed to them.

However, I do believe the public has accepted the proposition that the safety of the public is one of the functions of the Federal Government; that is, protection from hazards ought to be carried out somewhere in the Federal Government. And it does not necessarily restrict itself to fires. We want to be protected against earthquakes. We don't know quite how to do it yet. But nobody would quarrel with research on earthquake protection. We want to be guarded against hurricanes. Everybody is very pleased to be told when a hurricane comes.

So I think it's accepted by the public at large that protection from hazards, the safety of the public, is an acceptable public function.

Now we have all heard about the Public Fire Safety and Control Act of 1974. It is still on the books. I do not know why a political scientist or the Congress itself does not look back on its own functions to analyze why it is not working or what parts of it work, which parts are incomplete, and what yet needs to be done to fulfill its goals.

There has been in the period of time in which I was involved in the fire business, and we at the applied physics laboratory got out of it 6 years ago simply because we could see that the funding would be so difficult that to maintain even a small team was almost too much trouble. It couldn't be done.

Significant advances have been made. People do now know about how to design better furnitures, which at one time was considered by the furniture industry to simply be economically impossible. It would put everybody out of business.

It turns out about 50 cents' worth of good design, perhaps a dollar, makes a piece of furniture now nonflammable, whereas in the past, it would ignite with cigarettes.

There's much potential in the work being done now on the design of buildings, where if you can design buildings, you can design ships equally well, or if you can design ships, you can design mines, simply to understand how fires spread, how smoke spreads and what one can do to overcome it.

This work is incomplete. It needs another 10 years, perhaps, another 20 years to become conventional practice, but it's being done.

I do take some issue with the statistics that are being quoted. I might be quite mistaken, but I was still involved in the fire program in 1979 when the fire death statistic was suddenly downgraded by 2,000 people from what was then 9,000 or 8,500, to 6,500, because somebody had discovered that the old statistic, which was extrapolated from very limited data—people had thought that 2,000 people died in automobile fires.

So the number that you see on these charts prior to 1980 included 2,000 fire deaths which really turned out on detailed investigation never to have taken place.

So a lot of the initial drop, I think, is figmentary. It was an adjustment of bad numbers to become somewhat less bad.

So I'm not persuaded yet that we have turned the corner on fire deaths until I see the numbers, which I have not done lately. I'm familiar, though, with how much turns up if one makes detailed investigations of very specific cases to see whether things are really getting much better.

They might, but I'm not quite certain.

To respond to your specific questions, Senator Sarbanes, the economic and social cost of reduction in Federal support, that's very difficult to evaluate. I begged off. I do know, however, that when the mine fires 20 years ago were a serious concern and the mine union really insisted that something be done, the fire deaths in mines went down from about 1,000 to about 100 or less. By doing what the civilian population ought to be doing more of, which is good inspection, good preparation, these major savings of peoples' lives can be done, and have been done in specific cases. They're not yet being done for the civilian population, a much more difficult problem, but not impossible to solve. Other countries have managed to do a better job.

What is the appropriate Federal role in fire safety research and prevention?

It clearly should only do those things that it can only do and where it has a unique role. Twenty years ago there was much fear from many of the people you've heard today that there would be an unfair involvement of the Federal Government in doing things that the private sector can do well. I hear nothing about harmony today. I think people have changed their minds.

The Federal Government does have a unique role in the acquisition of good statistics and follow up the statistics to know what it says. It has a role in development of tools. I do find that even today, compared to the military, with which I have some familiarity, there's no place in this country where advanced techniques are being worked out. There is no Federal establishment that does engineering development of promising ideas, evacuation of people from high-rise buildings—I mean, where are the helicopters and rocket platforms that could do this job?

There are no tools to look at people lying on the floor in a burning building to find out what they are actually suffering from, how should they be treated when treatment can only be done in the next half hour or hour.

It's essential to get better techniques in this area.

And the research is quite obvious. The military spends billions of dollars on CQ3I, command-control, operations research. A fire department like New York City, which spends a half-billion dollars of city funds, to the best of my knowledge, has zero people on its staff whose job it is to evaluate the operations of the New York City Fire Department. At one time, they hired the Rand Corp. and ran out of money and have given up.

This is essential for a half-billion dollar operation, to spend a little of its funds to have some trained people who can oversee where the fires are, how to respond, what could be done.

It's not being done. And the Federal Government could help in financing these things, and they certainly should because they can't do it themselves.

The same thing has to do with the treatment of injuries. We hear about 100,000 injured people—I don't quite know what it means, but the National Institutes of Health has a very small program, if any, on fire toxicology and therefore, many people are lost who could be saved with better support.

So I'm really pointing out to the future. What we've heard today is quite true. Lots of work that needs to be done.

Question 3 had to do with the appropriate Federal role and what level. It's quite clear, as Professor Bryan has stated, that the present zero budget, of course, is indecent, but even the funds that have been scratched together by Congress are hardly sufficient to do more than a modest effort, which, compared to other countries, is modest.

I was asked to comment in addition to what the importance of Federal fire research grants are to universities. They simply cannot be involved in any work of this kind unless there are Federal grants available. At Johns Hopkins University, as of yesterday, on Friday, when I checked, there was no work being done in the school of hygiene and public health, no work done in the medical school, no work done at the applied physics laboratory, no work done at the Homewood campus.

It just cannot be expected for universities to become involved without some tie-in into a grantmaking organization.

I really have no recommendations to make that haven't already been made, except to do two things. One is, I think it is essential to reestablish some kind of an organization that can overview the entire fire field.

What we have heard today is the civilian section. The Department of Agriculture is interested in forest fires. The Nuclear Regulatory Commission is interested in nuclear power plants. The FAA has an interest in fires in airplanes. The Coast Guard is interested in LNG.

So the Federal Government is involved, but there are many things going on where people don't speak to each other, so there's a certain amount of overlap, which is not altogether bad. But when it comes to looking into the future to see what programs ought to be pushed, there's nothing like what used to be on deck, which was a committee of the National Academy of Sciences, the Fire Research Committee, who looked at everything, whether it was civilian or nuclear or forest, and have some input into what ought to be done, guidance about the future.

The second recommendation I would make is it ought to be possible to look at the Fire Safety and Control Act of 1974 and find out what parts of it have been accomplished, what parts of it still have to be done, and then make a public statement about how a public law ought to be administered over the long pull.

Thank you.

[The prepared statement of Mr. Berl, together with enclosures, follows:]

PREPARED STATEMENT OF WALTER G. BERL

I am pleased to respond to the request of the Joint Economic Commmittee to present my views on the "impact of budget restrictions and policy changes on our ability to protect the public from fire".

The letter of invitation stated:

"In the past several years, deep cuts have been proposed in the budgets of the U.S. Fire Administration, the Center for Fire Research at the National Bureau of Standards, and the National Fire Academy at Emmitsburg, Maryland. Although Congress did not allow these proposed cuts, the recent enactment of Gramm-Rudman, the impending elimination of General Revenue Sharing funds which municipalities have used effectively and extensively for fire protection, and the Administration's plan to reduce government regulation will seriously erode Federal support in the future for fire safety and prevention".

It went on to ask:

1. "What are the economic and social costs of the reduction in Federal support for fire prevention, research, and safety?"
2. "What is the appropriate Federal role in fire safety, research, and prevention?"
3. "To achieve an appropriate Federal role in these areas, what level of Federal funding and program resources would be needed? What improvements can be made in Federal programs that support the efforts of state and local governments?"

Introduction:

To insure 'domestic tranquility' the Federal government is expected to play an active role in reducing hazards to which citizens are exposed in the increasingly technological world in which we live. High-quality health protection is foremost, followed by remedies for environmental degradation. The Federal government has a role to assist in the avoidance of death and injuries from collisions in the air, on the sea or on highways, in protection from excessive radiation and from hazardous chemical substances, and with provisions against the consequences of natural disasters (earthquakes, volcanic eruptions, floods, and wind storms).

Protection from unwanted fires and explosions is also of concern. While individual actions and self help can do much to forestall potential incidents and mitigate their severity inputs from other, more organized, sources are also needed. The Federal government must accept responsibility for those aspects of the fire problem that cannot readily be solved on a personal or local scale or where assistance from voluntary associations is either inadequate or insufficient.

The Federal government has a particularly important role in building a broad base of informed understanding from which remedial or preventive measures can be designed. To provide the proper leadership and funding, to select appropriate approaches and to translate them into meaningful actions represents the unique and compelling role of enlightened governmental involvement. It does not currently exist in the fire field.

Unwanted fires touch the lives and fortunes of all citizens. Murphy's law ('If anything can go wrong, it will') can be extended to say 'Anything that can burn - will'. One needs to recall the enormously disruptive and costly consequences of unwanted fires in:

the Challenger shuttle explosion (1986)

the explosion and subsequent burning of the Chernobyl nuclear reactor (1986)

the threat of Nuclear Winter caused by mass fires

the costly rash of fires in public occupancies (MGM Hotel Fire 1980, Beverly Hills Supper Club, 1977)

the collision, burning and total loss of two 747 jets in the Baleares Islands

the disaster potential of a liquified natural gas (LNG) ship accident

the gutting by fires of naval ships in peace (USS Belknap) and in war (HMS Exeter, Falklands Islands)

the repeated fire threats in high-rise buildings (Sao Paulo, Brazil; Seoul, Korea)

the week-long disruption of a large section of New York City by the Bell Telephone Exchange building fire (1983) the enormous destruction of cities by fire in both war and peace (Hamburg 1944, Tokyo 1923, Chicago 1871)

the 3,500,000 household fires annually

the yearly fire death rate of nearly 8,000 persons in the U.S. and serious injuries to 50,000; the need for 2,000,000 fire fighters to be on alert and the $10 billion annual fire cost to the U.S. economy.

1. What are the economic and social costs of the reduction in Federal support for fire prevention, research and safety?

The Federal role in fire safety and research was formulated more than 10 years ago with the establishment of the National Fire Prevention and Control Administration (NFPCA) as a result of the 1974 Fire Prevention and Control Act. Due to inadequate initial funding, virtually negligible raises in support in subsequent years (expressed in constant dollars) and a seemingly continual change in the structure of this Federal agency (removal from the Department of Commerce to become an Independent Agency, and subsequent incorporation into the Federal Emergency Management Administration) it has not fulfilled the promise of its stated goals and the expectations of its supporters. Its budgets for the past several years have been reduced to zero, as have been the Administration requests for the principal Federal fire research arena - the Center for Fire Research of the National Bureau of Standards.

The costs of this neglect and of missed opportunities are difficult to quantify. The fire safety record of the U.S. has been (and is) among the poorest of all industrialized countries. The efforts during the past decade, underfunded as they were, provided some hope of improvement. But such improvements, especially when there is such a comparative low level of activity, can be expected to come only gradually. One must conclude that the stated goals of the 1974 Act (which were to reduce U.S. fire losses by 50% in one generation) will not be reached.

Even with adequate support and an effective organization, it takes time to build competence in such diverse areas as the generation and analysis of reliable statistics, the development of cost-effective design standards and codes, the introduction of new tools and operations into the fire source, the training of senior fire officials to apply novel operations methods, the advancement of the understanding and scholarship in the applied physics, engineering and medical/public health aspects of fires, and the teaching of the fundamentals of Fire Science in colleges and universities. Without them we are likely to revert to the state of passivity that was deemed unacceptable 20 years ago. For lack of adequate support competent people are forced to look elsewhere. New people will not be motivated to devote their professional careers to this field. The consequences will be that the already enormous social costs from fire losses can be expected to rise above the current levels.

2. What is the appropriate Federal role in fire safety, research, and prevention?

Responsibilities for keeping unwanted fires in check are widely dispersed within the social structure. While individual errors are responsible for the majority of civilian fire fatalitnes, large human and economic losses also occur in industry, in the transportation sector, in forests - in fact, anywhere where combustible materials are present. Elaborate protection mechanisms to minimize these losses have been built up in the past hundred years. Fire departments have been organized, building codes have been promulgated, burn centers have been established, and so on. Many of these efforts are clearly local and, at most, State-wide responsibilities. Others depend on the effort of voluntary standard-setting organizations, on inputs from industrial trade associations or on government departments with responsibilities for specific problem areas (such as the Department of Agriculture for forest fires; the Department of Transportation for airplane, and vehicle transportation fires and for rail and motor cargo fire protection; the Department of Defense for fire hardening of combat ships, planes, and vehicles; the Coast Guard for ship cargo fire safety; the Department of Interior for mine fire safety, the Consumer Products Safety Commission for products fire safety,etc.).

Despite these widespread specific concerns, there remains an overriding Federal responsibility for crucial components of the fire field. As mentioned above, (and spelled out in detail in

'America Burning') there is urgent need for satisfactory solutions to the following:

A. Reliable nation-wide statistics and their intelligent evaluation on all aspects of fires gathered consistently and over a long period of time to provide guide lines for trends and for future remedial actions. For example, the benefit of the recent introduction of residential fire detectors and sprinklers can only be assessed and improved on if their effectiveness in reducing fire incidents can be measured in detail. This requires careful attention by people who are experts in statistical analysis and, at the same time, acquainted with fire phenomena and human responses. No local establishment is in a position to carry out such an in-depth study without federal guidance and support.

B. The development and evaluation of better tools (both in equipment and in tactics) are beyond the resources of any local fire fighting department. It should be noted that the New York City Fire Department, with a complement of 20,000 members and an annual budget in excess of $0.5 billion per year, is not pursuing any instrument or equipment development or carrying out operations research and analysis that would benefit its own performance as well as those of Fire Departments elsewhere. The industry involved in the sales of fire extinguishment equipment is too fragmented and too small to carry out forward-looking developments and seeing them applied in practice. This is in sharp contrast to Japan, where Fire Departments and Fire Research

Establishments are closely linked to develop and evaluate new ideas in the laboratory and in the field. No such technology transfer mechanism exists in the U.S.

Thus, the development of novel ways of evacuation of skyscrapers (via, say, rocket-propelled platforms), the design of portable instruments that would measure, in real time, the toxic nature of the space in which fire fighters are working, the employment of helicopter-supported fire command and control posts on the fire scene, the use of rapid medical diagnostics to treat fire casualties, the design and evaluation of novel fire detection and control systems to minimize losses in high-rise and public-occupancy buildings - all these and many other approaches cannot be done at the local level. They require Federal sponsorship and support. Solutions would benefit the entire society.

In addition to these potential technological developments Federal responsibility also extends to the continued support of a vigorous research effort whose objective is to understand fire phenomena and to train a highly professional corps of practitioners. The 'hard' sciences of physics, communications and operations research, chemistry, the medical branches of fire pathology, toxicology and treatment and the understanding of the psychology of people under stress can make invaluable contributions to the design of cost-effective building codes, to the development of rational test methods, to the synthesis of new materials and to the modeling and prediction of fire growth and extinguishment under the myriad conditions where costly accidents are possible.

Such a program, too, is difficult to carry forward within the uncoordinated and fragmented approach that has been the custom. The creation and support of an adequately large group of experienced people and of research teams is fatally flawed if annual budgets are inadequate or fluctuate widely from year to year.

3. What level of Federal funding and program resources would be needed?

The level of Federal funding for the operations sketched out above depends on the ingenuity of the organization (or, rather, the persons) that carries the responsibility for working out and administering an acceptable and realistic program. The current level of support is probably too low by a factor of 5, based on the number and competence of available persons, the urgency of the practical problems and the state of understanding of principles. It is neither necessary nor desirable to create and staff a large federal agency. Many of the most desirable projects can be contracted out to established organizations (using the Fire Research Center/NBS and strong university departments for building-related research; assigning to the New York [or other large city] Fire Department responsibilities for equipment, tactics and operations development and evaluation; providing the National Fire Protection Association with funds for statistics gathering and evaluation; requesting selected universities and medical schools to teach fire science courses and train students; funding the National Institutes of Health to provide guidance on the treatment of toxic gas inhalation and burns; and employing not-for-profit establishments to undertake coordinated investigations on the causes and consequences of fires). But it is important to have one place that can view the fire problem as a whole and can design, fund and exploit strategies for its amelioration.

The current level of support for these activities is totally inadequate to make even minimal progress. The effects of the Gramm-Rudman Act, the elimination of General Revenue Sharing funds and the repeated zero-budget requests for the Center for Fire Research at the National Bureau of Standards (which has played a distinguished role on an academic as well as applied level of research) are bound to make an already marginal situation intolerable to the point where public safety will be seriously at risk and the costs to the economy will escalate. The U.S. record in per capita fire losses will not change and remain dismal.

4. The importance of Federal fire research grants to the university's ability to conduct fundamental fire research:

The public expects its experts to search out ways to reduce hazards (whether they come from natural causes or from man-made mishaps) and to apply them in practice when they promise clear benefits at not too great a cost.

In the 1950's the Federal government was urged to play a more vigorous role in the fire field. This was, in part, triggered by massive forest fires that taxed the capabilities of available resources and by concern about protection against urban nuclear disasters that became a possibility with the development of transcontinental ballistic missiles.

Initially, the National Academy of Sciences was asked by the US Forest Service and by the Office of Civil Defense to enlist the help of the scientific community which, with rare exceptions, did not appreciate that there were problems of interest to be thought about and to be solved. Lack of financial support for such work also was not helpful. There was little concern then with the day-by-day "traditional" urban fire problems, even though they were present for everyone to see and caused by far the greatest losses to the nation.

This request resulted in the formation of the Committee on Fire Research of the National Research Council, spearheaded by Professors Hoyt C. Hottel (MIT) and Howard W. Emmons (Harvard) One of its first acts was to establish Fire Research Abstracts and Reviews in 1958 of which I was the editor for the first 6 of its 18 years existence (when the Committee had to be dissolved for lack of funds!).

In 1961 an extended summer study was convened at Woods Hole, MA. to survey the scientific opportunities in the fire fields and to give some thought on how to provide the financial support that was almost non-existant at that time. It was proposed that a full-time fire group be established in the Federal government with a first-year budget of $3M and with primary emphasis on the urban fire problem. Alas, neither the effort to secure this funding nor the parallel effort to persuade skilled academic research workers to turn their attention to fire problems were successful. (Enclosure I)

However, ten years later, in part stimulated by this effort, the National Science Foundation initiated a novel program RANN (Research Applied to National Needs). Fire research (in addition to earthquakes, energy, tunneling and other applied topics with a tie to fundamental principles) was an integral part of this forward-looking undertaking, with a budget allocation of $1.5M. Together with three other universities (Harvard; University of California, Berkeley, Uuiversity of Utah) The Johns Hopkins University/Applied Physcis Laboratory (APL/JHU) became one of the four principal grantees.

When this part of the RANN program was terminated two years later and its functions and funds transferred to the newly established National Fire Prevention and Control Administration (NFPCA) there was justifiable hope that the United States was on the verge of a sustained and fruitful path - with the much enlarged Center for Fire Research at the National Bureau of Standards as the key Federal research agency.

Indeed, for a number of years spectacular developments made their appearance: The Harvard group (together with the Factory Mutual Research Laboratory) made bold forays into the modeling of fires in compartments and buildings, laying foundations for a rational design of fire-safe structures. The University of Utah concentrated on the toxic products of combustion that are ultimately the greatest danger to humans. The University of California pushed forward the understanding of fire-test procedures to the point of representing real life situations. The Center for Fire Research/NBS developed an impressive research and development program to provide to better design standards.

APL/JHU's major contribution was a 7-year study on the causes and consequences of fatal fires in the State of Maryland, undertaken jointly with the State Fire Marshall's office, with Fire Departments throughout the State of Maryland and with the Johns Hopkins School of Hygiene and Public Health. This massive study was recognized world-wide for its path - breaking methodology and suggestive results.

Alas, toward the end of the 1970's financial constraints became troublesome. In 1979 APL/JHU, unable to maintain a research team of 'critical mass' with the then available funds, made the reluctant decision to leave the fire field. A promising extension of the Fire Fatality Study to a state-wide investigation of serious fire injuries (with the participation of the Shock/Trauma Center of the University of Maryland Medical School had to be abandoned). The publication of a bimonthly Fire Technology Abstracts journal covering the world-wide technical literature in the fire field was stopped, as was research in the physics and chemistry of ignition, fire suppression and heat transfer. The skilled team was dispersed in other assignments. The productive network with the fire practitioners in the State of Maryland was disolved. Other divisions of The Johns Hopkins University also abandoned research on fires for lack of support.

Not much later, the Center for Fire Research at the National Bureau of Standards found itself without budget support from the Federal administration. For the past four years it had to maintain its functions (but at a substantially reduced scale) with the help of Congressionally-mandated funds and with research grants transfered from other Federal agencies and, of late, from industrial and trade associations. This uncertainty of funding, coupled with concern about the impending effects of Gramm-Rudman legislation on the financial ability of other Federal agencies to support the on-going programs bodes ill for maintaining a responsible fire program at the Federal level in the years ahead.

Epilogue and Recommendations

During my period of active involvement with fire problems interactions with colleagues in other countries were vigorous. Since fire knows no national boundaries, all countries have developed strategies to minimize losses. Making allowances for differences in climate and weather much can be learned from an intelligent analysis of world-wide fire activities. The success of Japan to maintain an enviable record of relatively small losses, while at the same time profiting economically by a vigorous pursuit of developing salable products (such as control rooms that monitor the fire-safe status of high-rise buildings and provide rapid countermeasures in case of accidents)is an example of benefits that can be derived from an approach in which individual initiatives, community interactions and an enlightened public support reinforce each other to bring about desirable results.

The appended reflections from a US/Japan meeting held in 1979 probably still express the current state of affairs. (Enclosure II)

In Madison's words 'the situation is too serious for despair'. What lessons can be learned? In contrast to the 1950's when it was difficult to find capable people in both research and practice, who were willing to think about fire research and technology, the situation at present is reversed. A large number of experienced people are available. Potential users in the fire service, in industry and in design are aware of benefits that could be achieved. Misconceptions and friction among competing interests regarding goals have, by and large, been removed.

What is lacking now is a consistent, steady, imaginative effort on the Federal level to formulate and support an extended technical fire program. The goals of the 'American Burning' thesis that led to the Fire Control and Safety Acts of 1974 have largely been abandoned. Inadequate funding (a national program at $13M per year at its peak!) was one cause. Another is the declining fortune of the organization that was charged with the execution of the proposed program and that has now lost nearly all ability to lead. The annual rescue operation by the Congress, to maintain a technical program at the National Bureau of Standards in opposition to the Administration's wish to withdraw all fiscal support, cannot long endured.

It would appear well to review what lessons can be learned from the stalled U.S. effort to solve problems that were clearly visible even in the 1970's and which are threatened by lack of support in the 1980's. (See Enclosure III). The Fire Prevention and Control Act of 1974 should be thoroughly reevaluated. An account should be given of the parts that succeeded and those that failed. Objectives that have not been met should be carefully analyzed as to their importance. Budgets and structure should be revamped to overcome past problems and be in concert with current realities.

A 'watchdog' group (along the lines of the Committee on Fire Research) should be made available to point to opportunities in research and development where the assignment of personnel and funds can make a substantial contribution to the easing of the fire problem.

Most important is to think clearly about the role that the Federal government should play in mitigating the consequences of losses to life and to the economy from all unwanted hazards. Once this role is clearly recognized a cooperative strategy can be drafted that permits all participating contributors (from the individual to the Federal, or even world-wide, level) to make their unique contributions.

Enclosure I

Reprint from—

A STUDY OF FIRE PROBLEMS

(A Study held at Woods Hole, Massachusetts, July 17 to August 11, 1961, under the guidance of the Committee on Fire Research of the National Academy of Sciences-National Research Council, Division of Engineering and Industrial Research.)

Conclusions and Recommendations

During the course of the summer study on hostile fire, certain features of the over-all fire problem have been clarified in the minds of the participants; the purpose of this section is to discuss these features briefly.

The problems of fire suppression and prevention have been under study for a great number of years by a wide variety of private and governmental organizations, and at the present time some 20 million dollars are spent annually in fire-related research and development work in the United States. However, most of this effort is applied work, a good deal of which is directed toward problems of satisfying code requirements and finding remedies for very specific problems. In addition, because the effort is supported by a wide variety of organizations, the direction of the total effect is diffuse, and areas of economic interest to the whole nation are often of insufficient interest, to any one group, to produce a desirable over-all level of attention.

The consensus of the summer study group is that a fire group should be established within the structure of the Federal Government to ensure that the national effort is a balanced one. This group would have as its prime functions the following:

1. The continuous assessment of the complete program of fire prevention and suppression, including the fire-related research and development work being carried out in the nation.

2. Based on the assessment of the national effort, the group should arrange for the execution of work not adequately supported. Where possible, this arrangement should take the form of encouragement and/or financial support to the private and public organizations already carrying out work in the deficient areas. Where necessary the fire group should actively support new work either by contract with existing organizations or by work within the organization of the fire group itself.

To carry out these functions effectively, the fire group should consist of a staff of technical people who devote full time to the project. Although the use of consultants and advisory committees may be desirable, the existence of a permanent organization with full-time director and technical staff is necessary. Of equal importance is the assurance of a budget which would permit a sustained effort.

An attempt has been made to estimate a reasonable budget for the fire group. It is felt that an initial annual expenditure of about three million dollars would be required. Of this sum, approximately one-third would be spent on fundamental research problems, one-third on problems associated with obtaining information of a fundamental and applied nature from large-scale controlled or natural burns, and one-third on studies of fire-related problems in the areas of economic and operational research. As the program develops, greater effort in these areas would be possible, and problems of an applied nature could be attempted in following years. The sustained effort required to support this fire group work may become as great as three times the initial effort.

It should be emphasized that the study group was aware of the efforts presently being made in industry and by government groups to support and to encourage fire-prevention and -suppression work. One of the major functions of the proposed fire group should be to stimulate such work; and where feasible, the resources of these organizations should be used in carrying out the proposed program.

The purview of the fire group should include all aspects of the fire problem. Thus, the group should be free to sponsor investigations of any problem which, in its judgment, is critical. These investigations should specifically include fundamental research problems in the pertinent fields of science, applied and developmental problems, operations research, economic analysis of problems at various levels of government, and educational problems.

The summer study group feels that a number of specific programs are required and should be initiated as soon as possible by the proposed fire group. These suggested programs reflect the potentially broad scope of the work of the fire group. General areas of interest will be discussed in the following paragraphs; specific recommendations for action are given later in this chapter.

At the present time there exists a great body of knowledge concerning fire-prevention and -suppression activities. This information includes areas such as techniques for good public educational programs, good fire-fighting tactics, and good professional training programs. Such information is used well in some areas and not at all in others. One of the important actions of the fire group should be to search for ways and means of achieving the adoption by state and local fire authorities of the best techniques available. Similarly, the fire group should also encourage the dissemination of fire-prevention information through the available communications media, to reach the general public, and through the support of regular and continuing programs in schools, to reach the young people of the nation.

In any study of fire problems, from the point of view of operations research or economics, it immediately becomes apparent that a tremendous amount of information is available but that this material is often incomplete, nonuniformly reported, or inaccurate, and that pertinent corollary data are often not collected at all. In order to facilitate the useful collection of data, two programs should be initiated. First, sufficient studies of the important economic and operational problems should be carried out to identify the desired information, and second, this information must be increasingly accurate, collected in a consistent and uniform manner.

The economic problems of importance certainly include the determination of the best level and distribution of expenditures for fire-prevention and -suppression measures at national, urban, and personal levels, and the examination of the economic incentives which operate to reduce fire costs. In the latter category, the determination, allocation, and regulation of fire costs, including insurance and taxes, should be studied.

Both the economic and the operations-research studies should be directed at the problem of establishing the best use of fire-fighting funds. For example, there is at present no rational way of determining the relative value of funds spent on fire-prevention work and on fire-fighting equipment. The fact that a great diversity of practices exists in the fire departments of the United States suggests that the best practices may be sorted out by the correct operational analysis. In any event, the techniques of operational analysis should be used to extract as much information as possible from the fires which annually destroy about 1.5 billion dollars worth of property.

Available techniques should be used to construct model fires and educational "games" for the training of firemen and for the evaluation of new fire-fighting practices.

Controlled burning of condemned structures or selected forest areas can be used to obtain quantitative information of interest in operational research and fundamental and applied research. Information obtained from controlled burns can be an invaluable supplement to information which can also be obtained from hostile fires. A major effort should be made to develop appropriate instrumentation and necessary techniques for this type of investigation.

The fire group should investigate the present national effort in applied research and should support needed work. Because most of the work being done in this field is supported by industrial concerns with immediate objectives in mind, the summer study group feels that supplementary efforts will be necessary.

Finally, the summer study group feels that the present effort in fundamental research is relatively weak. The fire group should support work on fundamental problems covering the entire purview of the group. For example, studies are needed on such fire-related phenomena as pyrolysis, ignition, fire spread, atmospheric interactions, fuel properties, effects of moisture, and extinguishment. These projects should be supported by direct contracts, where possible, but where necessary, should be carried out by the staff of the fire group.

The fire group should also have the responsibility of translating the results of basic studies, as far as possible, into useful fire-suppression tools. Thus, the ill-defined area between "fundamental" and "applied" work should receive particular attention.

As a principal part of the translation mentioned in the last paragraph, the fire group should be responsible for increasing the dissemination of information at all technical levels. The group should hold meetings and support publications with the purpose of bringing the fire problem to the attention of the engineering and scientific community, increasing the exchange of information between scientists, engineers, and professional fire people. Although a technical journal devoted to fire problems may be inappropriate at this time, an abstracting journal such as the Fire Research Abstracts and Reviews serves a very useful function.

In the foregoing discussion, the general problems falling within the purview of the proposed fire group are discussed in general terms. More specific recommendations follow.

Recommendations

I. A fire group should be established within the Federal Government to take over-all responsibility for the fire problem. This fire group should note and encourage work now in progress as supported by diverse public and private units; assess progress continually; seek, encourage, and develop new ideas on fire control; arrange for the execution of work not now adequately supported.

For these purposes, the fire group should:

1. consist of a director with an adequate staff of full-time personnel,
2. be given authority and have responsibility to contract for necessary

work with universities and nonprofit research groups, industrial concerns, and government organizations, and

3. be provided with a budget adequate for the work.

A first year budget of $3,000,000 is suggested. Perhaps three times this sum will be needed as the program develops. The fire problem, costing society $5,000,000,000 per year, deserves to be considered along with other national problems of this magnitude at the highest levels—the Departments and Congress. The fire group should, therefore, have authority at this level.

II. The fire group should make use of existing public and private organizations in carrying out its program.

III. The program of the fire group should include the following important activities:

1. Search for ways and means of achieving universal adoption by state and local fire authorities of the best techniques which have been developed by the more progressive states and communities. These include fireman training, prevention measures, and prefire planning.
2. Support public education in fire-prevention measures and fire consciousness. Additional study will be needed to develop specific measures.
3. Collect, organize, analyze, and disseminate data on fires. The most urgent need is a quantitative evaluation of the relative importance of organizational and operational factors in fire control, and their economic consequences. To be useful, pertinent data of adequate accuracy must be collected in a consistent and uniform manner. This will involve state and municipal organizations, and urban and forest fires.
4. Study the economic aspects of fire, including common-pool problems and cost-benefit relationships.
5. Study the effect on total fire cost of the variable factors of fire-control organization and response. These factors include leadership, fire-fighting tactics, prefire planning, and personnel training. To carry through this study, a scale of "fire hazard potential" for area classification and a general measure of "total fire cost" should be developed.
6. Examine the determination, allocation, and regulation of fire costs including insurance and taxes, required to promote more equitable distribution of costs and to produce an economic incentive to reduce risk.
7. Support a wide variety of fundamental research connected with fire phenomena, such as fuel properties, pyrolysis, ignition, fire spread, atmospheric interactions, effect of moisture, extinguishment, etc.
8. Support those special items of applied research that are of important social consequence but poor economic prospect. These items include special hazards, test methods and standards, and development of new techniques lying between fundamental research and commercial exploitation.
9. Use controlled burning of condemned structures and selected forest areas to acquire data on fundamental fire phenomena and the response of fire to extinguishing agents. Data should also be obtained on the effect of the various organizational and operational factors in (5) above.

10. Develop player-participation games for the training of fire-fighting personnel, for the investigation of fire-fighting techniques, and for the planning of interagency cooperation in fire-suppression activities.
11. Sponsor meetings and publications as required to bring the fire problem to the attention of the scientific and engineering community and to disseminate new knowledge to all interested parties.

THE JOHNS HOPKINS UNIVERSITY
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Enclosure II

CFP-79-077

2 March 1979

To: File

From: Walter G. Berl WGB.

Subject: Highlights of United States/Japan Natural Resources (UJNR) Meeting, Tokyo, Japan (February 4-8 1979)

I returned from the recent 4th Joint UJNR Panel Meeting on Fire Research and Safety (Tokyo, February 4-8) with a number of highly favorable impressions. The meeting was very well organized, efficiently run and well attended. The interchange of technical information was on a high level. The hospitality was superb. A listing of the schedule, attendance and contributed papers is attached.

1. In a manner that may be unique to their history and to their way of organizing technical group efforts, the Japanese have managed to fashion a public fire protection system that should be a model to all. They are confronted by a highly urbanized society, serious natural hazards (volcanic activity, earthquakes), crowded cities, large underground shopping malls as part of a complex transportation system and the widespread use of highly combustible materials in their buildings and heating systems. Japan's fire record, by all expectations, should be poor. But, in fact, it is so extraordinarily good that the Tokyo Fire Department should be dismantled for lack of a job to do, were it not for providing a busy ambulance service (255,000 calls/year) as a substitute for fire suppression (7900 calls/year) and as a standby force in the event of a major natural disaster.

2. Despite the enviable excellence of their fire record, public expenditures on the fire-fighting service, on fire prevention, public fire education and on fire research and development are high (comparable to most U.S. cities). The budget of the Tokyo Fire Department for 1977 is the equivalent of $500,000,000. These investments are justified on the likelihood of projected major earthquakes, with numerous fires contributing to the expected damage. Detailed disaster planning is evident (including water supplies, escape routes).

. The somewhat outdated and dispersed Japanese fire research and development facilities are currently being completely modernized. In the new Science City of Tsukuba, laboratories are being provided for Building Research and Forest Products Research studies that are superior in scale and equipment to anything existing or planned anywhere in the world. When completed, this vast complex of laboratories and teaching facilities will be an extraordinarily valuable resource for the Japanese R&D effort. (Plans are afoot for the holding of a World Technology Conference in 1984, at which time the Science City will be connected to Tokyo and to the Narita International Airport by a magnetic suspension railway with speeds as fast as 200 m.p.h.)

3. While specific fire problems are assigned to the research teams and laboratories of the most directly concerned ministries and universities, there appears to be a good interchange of information among them via coordinating panels, working groups and frequent technical meetings. Architects, in particular, are closely linked with the fire research effort and are frequently in the vanguard of developmental activities. What is surprising is the rapid adoption of fire regulations in the area of building design and the labeling of materials, thus providing for quick introduction of new techniques and protective systems. Few buildings outside of Japan can match the fire protection systems and control centers that are now installed in Japanese public buildings.

4. The Japanese attitude toward fire investigations can best be described as 'instant archaelogy'. Every fire incident of any significant size is carefully investigated, beginning with the fire outbreak itself, to obtain insights into fire fighting tactics, fire development and, particularly, into human behavior. This is followed by a detailed reconstruction of the fire event. The results are fed promptly into a well-developed data processing system.

Detailed annual 'White Books' on the national fire problem are published quickly. They contain useful statistical data that allow comparison of trends with previous years. In addition, they provide detailed descriptions of fire service organizations, fire prevention, and future planning. The Fire Service of Tokyo publishes its own Annual Report (also in English) with interesting details about its organization, and the accomplishments of this remarkable organization. A new Fire Reference Information Research Center dealing with fire data analysis and operations research will begin functioning in 1979.

5. The efforts expended on fire service training and on public education are substantial. A National Fire Academy provides advanced training for several hundred fire officers as well as the teaching of advanced specialized courses. The public is constantly involved in fire education through extensive use of the news media (all ten channels of Tokyo television bring some reminders of fire related matters to their viewers as a constant programming item), through public displays and festivals and through intensive home inspection and visitation programs. This outreach to the public is considered a vital function of the Fire Service and a substantial fraction of the personnel (as much as a third) are contributing to this preventive activity as part of their regularly assigned tasks.

6. With regard to fundamental research on fires and their consequences, it is fair to say that the U.S. effort is in the lead, both qualitatively and quantitatively. There are exceptions to this, particularly in the investigation of human behavior under stress. The work in U.S. universities and research establishments is more detailed, more thorough, and more ingenious. As a consequence, contributions to the understanding of principles (inhibition, toxicity, modeling) come mainly from the U.S. (and Great Britain). However, the conversion of this U.S. effort into useful developments and its integration into design principles or practical devices for the Fire Service lags. A crucial 'translation' step that facilitates the flow of information and ideas from the many research sources to the potential users is, by and large, lacking. By contrast, the Tokyo Fire Department has its own research and development facility where new ideas of an applied nature can be developed and tested. Novel devices and tactics can be carried rapidly from the idea stage to field evaluation, with few barriers standing in the way.

Detailed Observations:

Professor T. Handa (Tokyo Science University) is developing room temperature semiconductors that are sensitive to carbon monoxide. The tin oxide/antimony oxide system, enhanced by platinum or palladium, appears to be effective and specific to CO. Variations in sensitivity due to sample preparation have yet to be overcome. But the concept is valuable and may lead to detectors that respond only to specific products of combustion.

Professor Y. Murozaki (Kobe University) is carrying out experiments on the psychological and physiological responses of people exposed to hazardous conditions. A light-weight, portable equipment has been developed that monitors blood pressure and pulse rate by an attachment to the ear. Data are transmitted by telemetry. This system is available commercially for the remote measurement of vital functions under stress.

A number of interesting programs on human behavior during escape from fires are in progress. An analysis is being made on the evacuation of buildings (S. Horiuchi, Kyoto University) under simulated and actual fire conditions. Degradation of human performance in smoke-filled rooms is measured as well as the recall power of people in mazes (Fire Research Institute). A particularly novel evaluation of pedestrian movement in obstructed spaces was carried out in which people and obstructions are simulated by magnetic charges (Fukui University). Movement around obstructions, corners, bottlenecks can be visualized and displayed. If fire behavior (smoke movement) is superimposed, semiquantitative modeling of evacuation and survival in toxic atmospheres is possible.

Toxicity data on the combined effect of carbon monoxide and hydrogen cyanide appear to agree with the postulate that in mixtures of the two gases an additive effect expresses the effective tolerance. Toxicity screening is carried out for structural materials on a relative basis (using Japanese cedar wood as a base line). Tests are carried out in a modified Kishitani Apparatus. The time to loss of activity of mice in a rotating cage is measured at two specified decomposition temperatures in a constant flow of air (K. Kishitani, Tokyo University). The use of materials that are 'substantially' more toxic than the base material is prohibited in specified applications (hospitals, underground shopping malls) where their involvement in fires would add to the toxic level of the combustion products.

Professor Y. Nishimaru (Yokohama City University) is carrying out detailed autopsies of fire fatalities along the lines of the Maryland study. Seven of fifteen cases show elevated carbon monoxide intakes. Two had, in addition, strongly elevated blood cyanide levels.

It was pointed out that suicides by fire contribute nearly one third (!) of the total reported Japanese fire fatality losses.

The Japanese work on smoke movement and on fire-safe building designs has had a long history of accomplishments. At present, much useful work is being done of the assessment of actual buildings with respect to safety (Building Research Institute) and on the effectiveness of active fire protection systems (Fire Research Institute).

Conclusions:

In matters related to Fire Technology and its integration into the national economy, the Japanese efforts are outstanding. Many useful lessons can be learned. It is a pity that the language barrier makes it difficult to keep up with their work, even though the Japanese are making an effort to present some of their more important findings in English.

I have discussed this problem with Dr. I. Wakamatsu (who is on the Editorial Advisory Board of Fire Technology Abstracts) and with Prof. T. Handa. They will explore what could be done to make the Japanese work more accessible. The Proceedings of the UNJR Panel are a step in the right direction. However, its distribution is likely to be limited in scope. Also, it covers only a portion of the ongoing work and has a delay of several years built into its publication schedule. I believe that a modestly funded effort to stay abreast of the Japanese work would be worthwhile.

REPORTS AND TECHNICAL PAPERS

4th Joint UJNR Meeting (Tokyo, Feb. 5-9, 1979)

GENERAL OR TECHNICAL REPORTS
(Japan)

Building Systems and Smoke Control

J1 A Quantitative Assessment on Smoke Safety
by T. Wakamatsu (Building Research Institute)

J2 Effectiveness of Active Fire Protection System
by A. Watanable (Fire Research Institute)

J3 Investigation on the Compartmentation against Smoke Spread in Office Buildings
by Y. Hasemi & T. Shimada (Building Research Institute)

J4 Efficacy of Fire Compartmentation
by T. Moriwaki & T. Eda (Science University of Tokyo)

J5 A Methodology for Evaluating the Life Safety Planning of Tall Buildings in Fire Situations
by M. Kobayashi & S. Horiuchi (Kyoto University)

J6 Basic Problems on Evaluating Fire Safety in Buildings
by Y. Morishita (Building Research Institute)

J7 Development of an Evaluation System for Fire Protection Performance of Dwelling Houses
by T. Tanaka (Building Research Institute)

Fire and Smoke Retardants

J8 Current Studies on Fire Retardation of Polymers in Japan
by K. Akita & T. Mikado (University of Tokyo)

J9 Restrictions on Building Materials for Fire Safety in Japan
by F. Saito (Building Research Institute)

J10 Flammability Regulations of Materials Concerning Transportation
by T. Miyamoto (Railway Technical Research Institute)

J11 Regulations and Labelling Systems on Flame Retardance in Japan
by M. Furuya (Research Institute for Polymers & Textiles)

J11-2 Present State and Problems of Flame Proofing Control of Fibre Products in Japan
by Y. Uehara (Yokohama National University)

Human Behavior

J12 Experiments on Emotional Instability under Increasing Smoke Density
by T. Jin (Fire Research Institute)

J13 Experiments in Human Evacuation Behavior in a Maze
by Y. Watanabe (Fire Research Institute)

J14 A Study of Pedestrian Movement in Architectural Space
by S. Okazaki (Fukui University)

J15 A Psychological Analysis of Human Evacuation Behavior Based on the Continuous Measurement of Systolic Blood Pressure
by Y. Murozaki (Kobe University)

J16 An Experimental Study on Exit Choice Behavior of Occupant in an Evacuation under Building Fire
by S. Horiuchi (Kyoto University)

J17 Analysis of Occupant Behavior in an Office Building under Fire
by M. Kobayashi and S. Horiuchi (Kyoto University)

J18 Study on Man-Space Systems - Application of Automata Theory
by T. Watanabe, Y. Ikehara, R. Nakamura, K. Yoshida &
K. Hamada (Wasida University)

Fire Investigation Technique

J19 Fire Investigation Technique in Japan
by A. Watanabe (Fire Research Institute)

J20 Investigation of Fire Causes on Fires Occurred in Japan
by T. Takahashi & H. Matsuda (Tokyo Fire Department)

J21 White Book on Fire Service in Japan (1976)
by Fire Defence Agency, Japan

MISCELLANEOUS TECHNICAL PAPERS

01 Study on Checking Technique of Mine Fire Spreading
by K. Matsuguma, M. Umezu & S. Yamao (National Research Institute for Pollution and Resources)

02 Combustion Hazard of Combustible Materials under High Pressure Gas Atmospheres
by M. Naito, K. Komamiva & S. Morisaki (Research Institute of National Safety)

03 Evaluation of Acute Toxicity of Smoke and Gases from Smouldering and Burning Plastic Foams
by Y. Nishimaru et al. (Yokohama University)

GENERAL OR TECHNICAL REPORTS
(U.S.A.)

Building Systems and Smoke Control

U1 Stairwell Pressurization Systems
by I. Benjamin (CFR/NationalBureau of Standards)

U2 A System for Fire Safety Evaluation of Health Care Facilities
by H. Nelson & A. J. Shibe (CFR/National Bureau of Standards)

Fire and Smoke Retardants

U3 Future Directions of Flame and Smoke Retardance Research
by F.B. Clarke (CFR/National Bureau of Standards)

Human Behavior

U4 Panic Behavior in Fire Situations: Findings and a Model from the English Language Research Literature
by E.L. Quarentelli (Ohio State University)

Fire Investigation Technique

U5 Fire Investigations for Loss Prevention Purposes
by A.F. Willey (National Fire Prevention Association)

BACKGROUND PAPERS
U.S.A.)

B1 Experimental and Theoretical Analysis of Quasi-Steady Small-Scale Enclosure Fires
by Quintiere, McCaffrey and DenBraven (CFR/National Bureau of Standards)

B2 Some Theoretical Aspects of Fire Induced Flows Through Doorways in a Room-Corridor Scale Model

B3 Coagulation of Smoke Aerosol in a Buoyant Plume
by Baum and Mulholland (CFR/National Bureau of Standards)

B4 Human Fatalities from Unwanted Fires
by Berl and Halpin (APL/The Johns Hopkins University)

PROGRESS REPORTS

Fire Modeling

P1 (J) Japanese Progress Reports on Fire Modeling

P2 (U) The Status of Fire Modeling in the United States - 1978
by H.W. Emmons, C.D. MacArthur & R. Pape (Harvard University)

Fire Detection and Smoke Properties

P3 (J) Progress Report on Fire Detection and Smoke Properties
by A. Watanabe (Fire Research Institute), J. Miyama (Sophia Univ),
F. Saito & M. Suzuki (Building Research Institute)

P4 (J) Pt and Sb Profiles in the Sintered SnO_2-Pt-Sb_2O_3 System and Their Effect on I-V Characteristics
by T. Handa, H. Fukaya, T. Maruyama, K. Hoshino, K. Endo
& Y. Okayama (Science University of Tokyo)

P5 (U) Areas of Progress in Smoke Detection and Aerosol Research
by R. Bukowski (CFR/National Bureau of Standards)

Toxicity

P6 (J) Present State of Research In Japan of Gas Toxicity
by K. Kishitani, F. Saito, K. Nakamura & S. Yusa
(University of Tokyo)

P7 (U) Progress Report on Combustion Product Toxicity
by W. Berl (APL/The Johns Hopkins University)

ADDITIONAL PAPERS

Qualitative Theory of Flashover
by Y. Hasewsi

Studies on Probabilistic Spread of Fire
by Y. Aoki (Building Research Institute)

SESSION REPORTS

Building Systems and Smoke Control
by K. Kamagoe (Science University of Tokyo)

Fire Modeling, Detection and Smoke Properties, Toxicity of Fire Gas
by K. Nekano (Building Research Institute)

Fire Retardants, Smoke Retardants
by H. Abe (Forestry and Forest Production Research Laboratory)

Human Behavior
I. Benjamin (CFR/National Bureau of Standards)

Fire Investigation Techniques
W.G. Berl (APL/The Johns Hopkins University)

SCHEDULE
for
The 4th Joint Panel Meeting
UJNR Panel on Fire Research and Safety
- (Draft) - (Plan) -

Date/Time	Programme
February 5th (Monday)	
9:40 - 10:00	From Hotel to ZENKYOREN-Building (Room No. 18) Hotel: FAIRMONT HOTEL
10:00 - 11:00	Opening Session Opening Remarks Mr. Toshio MATSUI Secretary General of the Panel, Japanese Side Director, Research Planning and Information Department Building Research Institute, Ministry of Construction Opening Address Mr. Shin-ichiro ASAI Engineer General, Ministry of Construction Mr. Justin L. BLOOM Councelor for Scientifical and Technological Affairs, American Embassy Mr. Toshio SUGAWARA Head, International Section Science and Technology Agency Dr. Kiyoshi NAKANO Co-Chairman of the Panel, Japanese Side Director General Building Research Institute, Ministry of Construction Dr. Frederic B. CLARKE Co-Chairman of the Panel, U.S.A. Side Director Center for Fire Research, National Bureau of Standards Election of Chairmen Introducing Panel Members of Japan and U.S.A. (By Panel Co-Chairmen) Election of Chief Recorders

Date/Time	Programme
Cont'd- February 5th (Monday)	
11:00 - 11:15	Coffee Break
11:15 - 12:15	Joint Session Agenda: 1. Confirmation of the schedule for the 4th Joint Panel Meeting 2. Approval of the proceedings of the previous Meeting 3. Election of the chairman of each session 4. Appointment of the organizers for resolution 5. Any other business
12:15 - 13:30	Lunch
13:30 - 17:00	Technical Session "Building Systems and Smoke Control"
17:00 - 17:20	From ZENKYOREN-Building to the Hotel
February 6th (Tuesday)	
8:30 - 8:50	From Hotel to ZENKYOREN-Building
9:00 - 12:00	Progress Reports on "Modeling of Fire" "Detection and Smoke Properties" "Toxicity of Fire Gas"
12:00 - 13:30	Lunch
13:30 - 17:00	Technical Session "Fire and Smoke Retardants"
17:00 - 17:20	From ZENKYOREN-Building to the Hotel
18:30 - 20:30	Reception dinner at "FAIRMONT HOTEL", offered by Technology Vice-Minister, Ministry of Construction

Date/Time	Programme
February 7th (Wednesday)	
8:30 - 9:30	From Hotel to Fire Research Institute
9:30 - 12:30	Technical Session "Human Behaviour"
12:30 - 14:00	Lunch
14:00 - 17:00	Technical Session "Fire Investigation Techniques"
17:00 - 18:00	From Fire Research Laboratory to the Hotel
February 8th (Thursday)	
8:20 - 8:50	From Hotel to UENO Station
9:10 - 9:59	From UENO Station to TSUCHIURA Station (Train: TOKIWA-No.5)
10:00 - 12:00	Visit to Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fishery
12:00 - 13:00	Lunch
13:20 - 15:00	Visit to Building Research Institute
15:00 - 16:50	Visit to TSUKUBA Science City, and to TSUCHIURA Station
17:09 - 18:04	From TSUCHIURA Station to UENO Station (Train: TOKIWA-No.10)
18:10 - 18:30	From UENO Station to the Hotel
February 9th (Friday)	
9:00 - 9:20	From Hotel to ZENKYOREN-Building
9:30 - 12:00	Open Technical Session
12:00 - 13:30	Lunch
13:30 - 16:00	Closing Session Reports of Technical Session Resolutions

Date/Time	Programme
Cont'd- February 9th (Friday) (13:00 - 16:00)	(Closing Session)-Cont'd- Closing Address Dr. Frederic R. CLARKE Co-Chairman of the Panel, U.S.A. Side Dr. Kiyoshi NAKANO Co-Chairman of the Panel, Japanese Side Closing Remarks Dr. Kohei KUMANO Sub-Chairman of the Panel, Japanese Side
16:00 - 16:20	From ZENKYOREN-Building to the Hotel

THE U.J.N.R. PANEL ON FIRE RESEARCH AND SAFETY

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Enclosure III

THE JOHNS HOPKINS UNIVERSITY
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Telephone (301) 953-7100 and 792-7800

CFP-77-116

23 November 1977

Mr. Jordan J. Baruch
The Assistant Secretary for Science and Technology
United States Department of Commerce
Washington D.C. 20230

Dear Jordan:

I was very glad that you, Howard Tipton and I were able to sit down together to hear my concerns about specific problems in the Fire Field. Two stand out above the others.

(1) The most serious and pressing problem is the continuing underfunding (by an order of magnitude) of the Department of Commerce's undertakings in this area. Many others and I share the view that an NFPCA/NBS budget of $12-13M/year is insufficient to bring into being and maintain the comprehensive program that was envisioned in the Report of the National Commission on Fire Prevention and Control (which suggested an Annual Program Operating Budget in excess of $150M/year) and in Public Law 93-498. Even if the NFPCA effort were restricted to fire-related matters in residential structures, this funding limitation allows only a few program items to move forward with any momentum.

Only a little more R&D money is currently available than was the case prior to the passage of the Federal Fire Prevention and Control Act of 1974 and inflation has also taken its toll. Instead of attracting creative people from within and outside the Federal establishments and letting them solve problems the scarcity of funding is causing a dispersal into other fields of the relatively few R&D teams that have spent years acquiring the necessary insights and skills. Many good ideas have had to be postponed, particularly in technology, linking understanding, development and practical use. Support is minimal in improving protective equipment, developing novel evacuation and warning devices and investigating the inhalation of toxic combustion products and treatment methods. There is little innovative work in equipment design and evaluation for fire suppression or in the quantification of fireground operations and tactics. Research in ignition, extinction, materials evaluation, test methods and combustion dynamics is only marginally supported out of Department of Commerce funds. And most importantly, the translation of research results into engineering principles and their rapid introduction into practice remains to be accomplished.

THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
LAUREL, MARYLAND

CFP-77-116

23 November 1977

(2) The recent disestablishment of the Committee on Fire Research of the National Academy of Sciences has left a serious void. We are now without an independent group that can assess the entire Fire field. Such continuous monitoring by knowledgeable people (including members of the public) is needed to determine whether the coverage of the various technical facets is done well or indifferently, whether the pace of advance is rapid enough, whether the channels of communications among the concerned professionals and users are satisfactory. A reconstituted Committee, with a broad charter, could be of considerable value to the Department of Commerce and other Federal Departments and Agencies.

There have been so many spectacular warnings in recent years (a current fire safety crisis in nuclear power plants, unprecedented human losses in aircraft crash fires, the second worst civilian public occupancy loss in over fifty years, toxicity problems with fire retardants, oil pipeline fires, fires in telephone exchanges in the middle of Manhattan, forest fires near Santa Barbara, etc.) that it requires little imagination to foresee more unacceptable losses in the future. The prospects of having to cope with a Tokyo-like civilian fire disaster in a West coast earthquake is particularly chilling.

We must get a better hold on the problems. Could you help by bringing these matters to the attention of Frank Press and the Office of Science and Technology? Something must be done to break this current impasse.

Yours sincerely,

Walter G. Berl
Group Supervisor
Fire Problems Group

I heard your "China" talk at NBS the other day. It was very interesting.

Senator **Sarbanes**. Thank you very much, sir. It's been a very helpful panel. I have just a couple of questions, although I know the hour is late.

Mr. Clarke, I know it's in the record because we included your prepared statement, but I think it would be helpful for you to take a moment just to cover in this open session your comments about the impact on the Center for Fire Research of the constant chipping at its budget.

Mr. **Clarke**. I'd be happy to. At my time at the Center for Fire Research, I would say it probably took us from the early 1970's up until close to 1980 before we really had in place the inventory of skills that you need to mount a first-class research program. We had excellent people all the way along, but part of it was the question of this being a new area and, indeed, those people needed to, while they may have had degrees in physics, they weren't necessarily fire experts because there aren't that many places that one goes to learn fire science.

One takes a good academic background and by doing research over the years, you get the competence in combustion and fluid mechanics and all the interdisciplinary things which blend together which make you, I guess for want of a better term, a fire scientist. So they don't grow on trees.

At about the time that we thought we had a critical mass for this sort of research, the budgetary process began that has continued up until this point, which is OMB's proposing zero funding for the Center for Fire Research, the funding eventually being restored and, in fact, if it weren't for the Congress of the United States, the Center for Fire Research would have been simply a footnote in the history books for several years now.

But you cannot insulate your staff totally from the stresses of the time between when the President's budget is published and when the funding is restored. That's about an 8-month period where, unless something happens, the staff knows they're all going to be on the street at the end of the fiscal year.

To ask a staff to continue to work on very tough technical problems and to do the kind of job that the Center for Fire Research and the Bureau of Standards requires, which it has to be the best possible job to be done, to ask the staff to do that in that kind of environment I think is an awfully big order.

And yet, for 4 or 5 years, as far as I can see, both the quantity and the quality of the work coming out of there has been excellent.

It has, however, to take its toll one of these days. Even when the budget is restored, there almost always is a small—let's take our piece of the general cuts, let's take a 5- or a 10-percent cut along with other programs. When you do that two or three times at 5 or 10 percent compounded, a budget that was never very large in the first place, again, you have the situation where they know at the end of the year there is going to be a few less people around and next year we'll start with a few less. And while I suppose some tension is okay, nevertheless, an atmosphere which is predominantly tension and predominantly uncertainty is just a very, very difficult way to operate, especially in a research organization.

Senator **Sarbanes**. Three of you were members of the United States-Japan National Resources Panel on Fire Research and

Safety. I think, Mr. Clarke, you chaired the American delegation. And I assume that, Mr. Jackson, you've had some exchange with insurance companies overseas.

How do you all contrast what we are doing with what's taking place in other countries on the fire safety and prevention front?

Let me put the question this way. Why is our rate so high compared with other countries? And what is it that they do that I assume we're not doing that could narrow the gap?

Mr. BRYAN. Well, I think, Senator, essentially you have to look at it historically. The countries that I'm familiar with, Japan, for example, it's always had a federal focus and several federal agencies. They've always had federal labs. They just completed a very new, outstanding facility out at their science city outside Tokyo.

If you look at the local fire department, take Tokyo as an example, they have their own fire research laboratory run by the fire department working on empirical operations research problems. In the area of prevention, they had over 250 fire prevention education officers, most of whom were female, most of whom were educated as educators and then trained to transmit fire prevention messages.

But then, beyond that, I think you have a different attitude in both Japan and Europe relative to property and relative to the transmittal of property as a tradition of handing down household land and houses, and there's a different concept of the protection of that property.

In Japan, if you have a fire, you have endangered the whole community and the neighbors. But in addition, you have robbed your children of their inheritance.

In our country, where we have a different historical, social, cultural perception, we change houses four and five times in a lifetime. It's an entirely different social, cultural climate.

There are also some differences in the enforcement of the laws due to the different types of government, which I wouldn't want to transfer to this country, but it's a whole different way. The Japanese, in particular, when they talk about fire, they're referring to the serious conflagrations they've had, and everybody in that community is aware of this fire. They have buckets designed in a triangular shape that they put in the corner of the house that's to use for immediate firefighting.

They did tests on kerosene heaters on shaker boards before UL ever tested them on shaker boards to find out what happens when the heater tips over, how you prevent the ignition, and they essentially devised safeguards that are now on heaters everywhere, from this local Tokyo Fire Department Research Lab and the Government lab.

So, historically, fire prevention research has been a national issue in those countries and it's only been in this country for 13 years.

Mr. BERL. If I can add to it, I'm a Japanophile in that regard, too.

I think on this shaker business of oil burners, if I'm correct, they called these fire-causing things in and gave people a new version, which was designed to not do the igniting, free of charge. So people would simply trade in what they had for something that they now have without any cost to the people.

So it was a very simple public gesture of making fire safety pay off quickly.

Senator SARBANES. That was a nationwide program?

Mr. BERL. Well, I'm not sure. It may have been Tokyo only, but it certainly was on a very large scale.

Mr. CLARKE. It was Tokyo inspired, I think. Wherever it was appropriate, it was also followed.

Mr. BERL. In our instance, here, for example, if one would give away a fire detector or two to every house in the country, it would be a cost of $500 million, not very much.

So instead of waiting for people to buy, they simply ought to have the equipment on deck and you'd save your $500 million in 2 or 3 years, several times over again. So you can make giveaway programs pay off.

The other thing that the Japanese do very well, their technology is very good. When they have a fire, they have a helicopter that comes overhead and takes pictures of what goes on and where the fires are and what the traffic is doing. Now you can get through the traffic mess and it's all televised back to headquarters and headquarters is in charge with an operations post to where the fire is.

They're very well organized as far as knowing what to do; whereas, in this country, I don't think anything like this exists. A fire chief has to find out where the fire is and whether it is spreading. They have technologies available to them which they're using.

In addition, every day they post in their fire station the record of what happened the day before and the week before and the month before and the year before in the country as a whole. So their fire data collection system is quick. They know exactly where things stand.

When something seems to go out of kilter, you know, some new product gives trouble, they investigate very carefully and a blanket that's badly designed shows up on a microscale most. You know, every fire has somebody looking at it simply because they have such an enormous number of people with so little to do that they can afford to do this.

The Tokyo Fire Department has about the same number of people in it as the New York City Fire Department, the same budget, but they have only about a tenth as many fires to respond to. So they have not much to do, but spend most of their time in inspecting and checking and followup and public displays and it pays off.

When the disaster comes, you know, as in Los Angeles, an earthquake, they think they're ready. At least they try to be as ready as they can be with this large number of competent people standing by on a day-by-day, year-by-year basis. You couldn't justify 20,000 firefighters in Tokyo; and yet, it pays off, I think.

Mr. CLARKE. One thing to add and Mr. Berl touched on it.

In regard to the statistics, the Japanese have about the same loss per fire as we do in the United States, either the dollar loss or the likelihood of human loss. But they have about a tenth as many fires.

So there's a difference in frequency, not severity, that seems to be the difference.

The root causes are, to some extent, speculative because the best you can do is hypothesize, as you've heard some of the discussions in the different ways we approach regulation and what one population is willing to tolerate versus another as far as intrusive fire prevention measures.

But there is a tremendous cadre of local organizations in firefighting and it is my view that a lot of fires get stopped when they are so small that the fire department doesn't hear about them.

So while you may have the same number of ignitions in the two countries, the number of fires that ever get reported to the fire department in Tokyo are a small fraction simply because the other 90 percent of the population stopped it when it was still this big [indicating].

You can do that, *a*, with a fire-conscious population and *b*, if you've given them the measures to address it.

We, as a matter of policy, sometimes decide not to do that because in this country you often hear, don't try to fight the fire. Leave the building, call the fire department, let someone who we're sure knows what they're doing handle it because there are risks.

That's a choice we made. We have other reasons for making that kind of choice. But it all comes down to the same point that we have the same severity of fires as the Japanese do, but they just don't have very many.

Senator SARBANES. Mr. Jackson, do you have any observations on that?

Mr. JACKSON. On Mr. Clarke's last comment about don't risk yourself, get out of the building and let the fire department worry about it, corollary to that is a rather painful one for me of don't worry about it, it's insured. [Laughter.]

I would like to go back to an earlier point, if I might. It was referred to by several others, but not specifically stated. And that's that the two projects I referred to, arson and residential sprinklers, are excellent examples of the Federal Government starting something and handing it off, but keeping enough of an interest so that they have control of it.

These are old projects; where are the new projects? These 20 people who are currently onboard are all trying to fulfill several functions in order to make a platoon act like a company-size unit, if you will. And it's not fair to them and it's not fair to the country. We're not getting what some people would expect from the existence of a fire administration. I'd like to see it get back to where it should be.

The second thing goes back to a comment that I believe Mr. Bryan made—no, it was Mr. Berl—that spinoff of Murphy's law, that things that can burn will burn.

I'd like to add to that, things that won't burn can be destroyed by fire.

We had an exhibition hall in Chicago, McCormick Place, all steel and masonry. Not a thing there that burned until you moved something into it. And then the fireload of exhibit items that were moved in there for the show burned with such intensity that the steel beams sagged, the roof collapsed and that dragged down the walls.

So while it didn't burn, it sure wasn't worth anything when it was all over.

Senator **Sarbanes**. I'd say, just as an observation, that one of the problems is we don't have a sense of social accounting. It goes back to the point you made, Mr. Jackson, that either we are going to pay it in taxes at the Federal level or the local level or privately through their premiums or losses or whatever.

So you have to add it all up. We tend to look at it from the point of view that this is a government expenditure and therefore a cost in the budget. But no one sets off against the budget expenditure the money saved because we don't have the fire or check it earlier on and therefore don't experience all that loss, which either the insurance company would pay or the private person would have to sustain, or something of that sort.

If we think in those terms, you're clearly coming out way ahead if we spend this government money. But that's a government budget item. If you knock it out of the budget, the Government benefits. But doesn't reflect the cost, because the cost comes down somewhere else and is accounted for differently. The whole picture is never put together so that we can really look at it and see that there's an enormous savings to be realized here if we just have sense enough to do it.

Mr. **Jackson**. Just to give you an idea of how great the savings can be, when I was working with the residential sprinkler subcommittee of the National Fire Protection Association, the question came up regarding if we had residential sprinklers in the homes, how much of a discount could the people expect on their insurance? How would this new protective device be reflected in the cost of the insurance?

At the time, the insurance services organization, which is a rating organization that many major insurers subscribe to, had recommended that a 5-percent discount be allowed for residential sprinklers. At the completion of the 1980 residential sprinkler tests, a copy of which, the insurance report on that is attached to my comments that I submitted, ISO went back to their homeowners' committee and asked them to review the results of the tests. And this was one of the things that the Federal Government provided the environment in which the private sector could take place and gave them a degree of freedom in how they participated so that when it came time for the industry to say what is the value of all of this, they were dealing with their own figures and they felt they were entirely credible, or at least figures that were gathered under government supervision, but with strong supervision by the private sector.

They came back and said 15 percent is an appropriate discount. Now that's not 15 percent of the fire insurance portion of the policy. That's 15 percent of the total homeowner's premium. And that covers theft, liability, windstorm damage. In your homeowner's policy, somewhere between 32 and 38 percent goes to cover the fire losses.

So if you take that 15 percent of the entire premium and say, what's that worth if you apply it to the fire insurance portion only, you are getting close to 75 percent discount for residential sprinklers. That's certainly something that should be very helpful to the individual homeowners.

It helps, again, to keep the cost of insurance affordable without endangering the solvency of the insurer.

Senator SARBANES. That's exactly the point. That's very helpful testimony. But somehow, we can't get that reflected in the Federal budget, so to speak, or the thinking is not broad enough to encompass that. That's one of our big problems.

Yes, Mr. Clarke.

Mr. CLARKE. Perhaps I can add something.

The private sector now spends a tremendous amount of money on fire research and involves its own product development and uses directly—my firm, in fact, my clients are almost all private companies. They're not governments. We are concerned with using today's high-tech fire protection where you can burn down a building on a computer to solve specific problems for specific clients. An architect wants to design a building that will not burn down and that will give somebody an appropriate amount of escape time. But because of the regulatory environment, we can come in all day and make the rosiest words in the world, but the ultimate decision of whether we're right or wrong and whether that building really, as proposed, will or will not burn down by fire, is because we say so or not.

We're not going to build the building and do it to find out.

So, therefore, the credibility of that work has to be very high, which means that when the techniques were developed, they shouldn't have been developed by the architect or they shouldn't have been developed some place like the Federal Center for Fire Research because then you're taking that tool, which it has been agreed, is appropriate to make this kind of measurement, and simply using it, maybe changing it a little for the application, but you're not walking in with a story from top to bottom. You have some independent point of reference.

So I think that's the part that this continuing slogan, let the private sector do it, that's the part that has been missing, that without that potentiating effect, without the imprimatur, if you like, of someone who is not involved or about to be involved in litigation or a claim or getting a code approved, unless the techniques are developed in the absence of that kind of pressure, they're not going to be credible and they will not be used.

But once they are, for every 10 cents you spend in developing them, they're going to save the eventual users dollars.

The return is marvelous. It's a lot better to burn a building down on a computer than to either not have any idea how it's going to burn or burn it in reality.

Senator SARBANES. Am I correct in my impression that the arson rate in this country is very high compared with other countries? And if so, why is that?

You've been working on the arson problem. You might want to address that, Mr. Jackson.

Mr. JACKSON. There probably are no more fragile statistics in this country than those on arson. The insurance companies, who should have good figures on these, do not. One of the reasons is that you may not mark a file "arson" until the person has been convicted and the appeals have run out, or you are in danger of putting something in his file which later could cause him difficulty and you can't substantiate the comments, so you would be very vulnerable.

As a result, insurers, who only, by the way, are concerned in their records, even when they are, with economic arson, as opposed to revenge, juvenile arson and others, which makes up a very substantial part of our problem, the insurers' records as a result are not helpful.

This was one of the reasons why the insurance companies joined the firefighters in urging the FBI to make arson a part 1 crime in their uniform crime report.

But there, again, this has only been working for 2 or 3 years now and the system for getting information from the firefighters to the FBI is one which is loaded with problems of tradition and turf.

So we don't know how bad our figures are. We have a feeling, based on the number of people who've been caught, convicted, and the number of years of hard-time sentences that have been handed out in some of the metropolitan areas, that we are doing a much better job of apprehending. And all the people who are going to jail are not lowly torch where the thing was brokered down to the point where a wino or a doper gets his evening fix or $200 to go burn a building down.

We're getting some of the conspirators, and some of the white-collar people are going to jail. We feel that that is going to have a helpful deterrent effect.

But there's a great deal that's yet to be done, not only on economic arson, because a lot of the arsonists are part timers. They're people who are—they're not professional arsonists. Some of them are rather normal citizens who find themselves between a rock and a hard place and they don't see a crime where nobody gets hurt as being all that bad if the difference is that they go personally bankrupt.

So there are people who have lost their jobs and they're living in a depressed market where there's little resale value for their homes, who are trying to sell them to the insurance companies.

We're trying hard to resist. And sometimes it costs more money to resist than it would to pay off. But we have to do it as a way of sending a message out that this is not an acceptable social behavior. But we're doing our part on this. We really need the leadership of an organization like the U.S. Fire Administration to help oversee what is being done and to help get the leadership together periodically to review and see if last year's or last decade's plan is still appropriate or whether it needs to be fine tuned and reenergized.

So, I'm sorry, I can't answer your question, Senator, regarding whether we're better off or worse off than other countries. I know there are some countries—well, they joke about Greek fire. They forever have acts of God in their restaurants.

Arson has traditionally been a way of solving some financial problems with certain groups overseas, just as much as scuttling ships were as a way of raising money to finance new bottoms.

So arson is not a unique problem to this country as an economic problem.

Mr. **Clarke**. It's virtually unknown, I think, in Japan from an economic point of view.

Senator **Sarbanes**. Let me ask about the Consumer Product Safety Commission. One of the things we're looking at in the rush for deregulation is the exposure to health and safety problems. We don't want to regulate simply for the sake of regulation, obviously, but deregulation is being to the point of creating harmful health and safety consequences.

Do any of you have any comments on the fire prevention problem that relate to the work of the Consumer Product Safety Commission?

Mr. **Berl**. Well, I do have strong views because we've looked at the fatal fires in detail which are typical of what goes on and tried to look back to see what the causes are.

By and large, somebody makes a mistake, either a human being makes an error or there's some design problems that are at fault. I think the consumer products people, if they looked at the statistics in much more detail than they can do now, would find pockets where things are in need of repair where changes would be significant, not so much as a baby's doll being made out of material that burns too easily, but, say, home heating devices simply being inadequate to protect the people who buy them.

To explain what I'm saying, if you take the U.S. record apart to find out—we look at the average across the country as a whole, but that's rather misleading because the worst parts of the country are 10 times worse than the best parts of the United States. I mean, there are places like Alaska and the District of Columbia and places in the Deep South where the death rates are very high, and then there are places not far away, like Utah and Nevada and pockets where the death rates are one-tenth as bad.

Then one wonders, what is the reason for this difference? It can't be all just black against white because that isn't so.

It turns out in the South, one of the leading problems are domestic heaters that are used infrequently because the country, by and large, is warm, except occasionally there's a cold spell. People buy temporary heaters which are installed and badly installed and they cause a great many fires.

Well, it's a design problem of designing better heating devices. And this difference of 10 to 1 isn't entirely due to heaters, but there's a large part of that mixed up with heating devices that are not built in as we are accustomed to having them in Maryland.

So, therefore, the Consumer Product Safety Commission would say, well, look, here's a real safety problem. Let's do something about it. I think one would see it very quickly in the statistics.

Senator **Sarbanes**. Well, thank you all very much. It's been a very helpful panel and we appreciate your testimony and your responses to the questions.

The subcommittee will stand adjourned.

[Whereupon, at 1:41 p.m., the subcommittee adjourned, subject to the call of the Chair.]

APPENDIX

INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS
1750 NEW YORK AVENUE, N.W., WASHINGTON, D.C. 20006
TELEPHONE NO. (202) 737-8484

John A. Gannon
President

Alfred K. Whitehead
Secretary-Treasurer

TESTIMONY

Before the

SUBCOMMITTEE ON INVESTMENT, JOBS, AND PRICES

of the

JOINT ECONOMIC COMMITTEE

On

FEDERAL FIRE SAFETY PROGRAMS

JULY 28, 1986

OFFICES OF THE FREDERICK COUNTY COMMISSIONER
12 EAST CHURCH STREET
FREDERICK, MARYLAND

presented by

Martin F. Rouse
Maryland State President
International Association of Fire Fighters
AFL-CIO

Affiliated with:
AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS • CANADIAN LABOUR CONGRESS • NATIONAL FIRE PROTECTION ASSOCIATION

Mr. Chairman, members of the Committee, my name is Martin Rouse and I am the Maryland State President of the International Association of Fire Fighters. The International Union has over 5,000 members in the state of Maryland. We appreciate the opportunity to appear today to express our views concerning the impact of the budget cuts on the operation of the federal fire programs and the country's ability to protect the public from fire and disaster. In order to better understand our concerns on what we believe is the inadequate funding of essential governmental fire safety programs, a brief review of the history of the focus on the fire problem by our federal government would be helpful.

It has now been almost 15 years since the National Commission on Fire Prevention and Control released its report entitled, "America Burning". The findings in that report conducted by a distinguished Presidential Commission on Fire Prevention and Control helped open the eyes of the American public and our nation's government to some harsh facts. The United States, one of the most advanced industrialized nations in the world, had the highest per capita death and property loss rate as a result of fire of all the world's major industrialized nations. The report pointed out that there were 12,000 deaths each year due to fire and more than $11 billion in wasted resources due to destruction of property. To combat this immense national problem, the Commission recommended the following:

1. That Congress establish a U.S. Fire Administration to provide a national focus for the nation's fire problem and promote a comprehensive program with adequate funding to reduce life and property loss from fire.

2. The establishment of a National Fire Academy to serve as the hub of a national training and educational system for the nation's fire services.

3. The implementation of a national fire safety education program.

4. The reallocation of local resources from primarily fire suppression to fire prevention.

5. The improvement of equipment and techniques to reduce fire fighter death and injury.

6. Research into the urban fire problem.

7. The reinforcement of supporting programs in other agencies, including an increase in burn treatment centers and programs in the U.S. Department of Health, Education and Welfare.

The Fire Prevention and Control Act of 1974 was structured to provide for a United States Fire Administration, and a National Fire Academy within the jurisdiction of USFA, to facilitate specialized training in areas subject to the jurisdiction of fire protection agencies and to assist state and local governmental units in the planning and implementation of their own fire protection programs.

The recommended appropriations for planning, development and implementation of this proposed U.S. Fire Administration was $5 million for the first year, $50 million for the second year and $128 million for the third year.

For the first time, our nation's fire services felt that the United States Congress recognized that federal attention must be given to this terrible crises occurring in our nation. Congress had made clear that fire was an undue burden affecting all Americans and that such losses of life and property from fire were unacceptable to the Nation. Congress further stated that the unacceptable high rates of death, injury and property loss from fire could be reduced if the federal government established a coordinated program to support and reinforce the fire prevention and control activities of state and local governments.

The nation's fire service organizations were hopeful that Congress' newly stated commitment to combat the national fire problem would at long last turn around the shameful trend toward astronomically high death and injury rates and financial losses as a result of fire. Unfortunately, the recommended funding levels for this new Administration were never reached, never even close. The USFA has been funded at a miniscule level since its establishment. During this same time, our nation's fire service organizations, including the IAFF, through the Joint Council of National Fire Service Organizations have strongly supported the reauthorization of the Fire Administration and strongly supported increased funding for the Administration, the Fire Academy and the Center for Fire Research each subsequent fiscal year.

During the Carter Administration, the USFA was removed from the jurisdiction of the Commerce Department and melded into a super disaster oriented agency known as FEMA. Now, after over 5 years of FEMA, not only have we been faced with inadequate funding, but since 1982 we have been consistently threatened by the current Administration with recommendations for the elimination of the U.S. Fire Administration and the Center for Fire Research. Only through the efforts of the Joint Council, its member organizations and the continued and consistent support of the U.S. Congress have these programs survived.

So, where are we today? Great strides have been made in reducing the number of deaths and injuries due to fire. The number of deaths and injuries due to fire has dropped by at least one third since the institution of federal fire programs in 1974. There are many reasons why this is so, and the various federal fire programs have contributed significantly to this success. The success came about as a result of public education, technology development, fire fighter training and arson prevention. However, there is still much more work to do. Despite the successes, the United States continues to have the highest death and injury rate due to fire of all the industrialized nations. Even so, we are consistently looking at Administration budget requests which would effectively end these critical federal fire programs. What will we lose if federal fire safety programs are terminated or funding reduced?

- Vital research projects conducted by the Center for Fire Research: The Center for Fire Research is the only national scientific center devoted to the study of the chemistry and physics of fire. The elimination of this Center would make the U.S. the only industrialized nation in the world without a central fire research body. As an example of its critical work, the CFR has played a critical role in the study and development of nationwide toxicity standards for building materials.

- Critical arson protection programs: The USFA has developed and maintained an extraordinarily effective anti-arson program which includes support for community anti-arson activities and an arson information bank.

- Fire Fighter safety and health support services: The USFA has sponsored several important programs contributing to the increased safety for fire fighting personnel, including the development of protective clothing standards for fire fighters through its "Project Fires" program. This program, in conjunction with NASA, was responsible for the development of revolutionary safe and lightweight protective clothing. Project Fires also worked with the private sector to develop fire safe clothing.

- Essential training for fire fighters: The National Fire Academy has provided thousands of fire fighting professionals each year with essential education and training programs. One of the many fine programs the NFA has instituted is the Open Learning Fire Service Program. This program provides fire fighters in all 50 states with the opportunity to earn a baccalaureate degree in fire administration and fire prevention technology. Fire fighters are able to learn at a distance from the college campus while guided and assessed by faculty members. We believe that this program is a critical component for increasing the level of professionalism of our fire service personnel. The IAFF is very proud to be associated with the Open Learning Fire Service Program. It is a high quality cost-effective approach that provides the only higher education bachelor's degree opportunity available to all of the nation's fire fighters.

In our view, fire fighter health and safety is the most important programatic area within the U.S. Fire Administration. As you are well aware, fire fighting is among the nation's most hazardous occupations with one of the highest line of duty death injury and illness rates. Congress must not abandon the nation's fire fighters who risk life and limb daily in communities across the nation.

However, there are still many important areas of fire fighter occupational health and safety which need to be addressed, such as the development of a standardized medical protocol for the treatment of injured fire fighters so that all fire fighters can receive the highest quality medical care possible when they are injured. There is also a great need for research and development of improved equipment, such as ladders and ropes, to combat the number of needless tragedies which occur each year as fire fighters fall victim to inadequately built ladders and ropes. Likewise, the need is great for research into the impact of occupational stress and exposure to burning synthetics and carcinogens on our profession and the development of methods for limiting the adverse effects of these exposures.

Another example of the ill-effects of budget cuts on fire programs is the Apprenticeship Training Program funded by the USFA. This program, managed by the IAFF in cooperation with the International Association of Fire Chiefs, provides support for the development and tracking of basic fire training and related work in cooperation with municipal governments. The program is vital to the fire services and should be continued and adequately funded. At this time its funding has been terminated.

While some progress in combating the fire problem has been made, we must stress the absolute necessity of increased funding for the continuation and expansion of the U.S. Fire Administration's effort if the unacceptable death and injury rates among fire fighters are to be reduced.

Mr. Chairman, our Union well understands the pressures and politics of the budget process. We also understand the enormous pressures on Congress to reduce the deficit. We do find it interesting, however, that at the same time that our country is spending hundreds of billions of dollars to develop questionable weapons and other civil defense systems, it is still only spending a few dollars toward the protection of our citizens from the daily ravages of fire which takes lives, causes severe crippling injuries and destroys tens of billions of dollars in personal property in every state of this nation. The threat of fire is one of the most severe threats to the security and safety of our citizens. Money spent to combat this problem will be money well spent.

We ask for the Committee's support not only for the reauthorization of federal fire programs programs but also for an increased commitment in funding so that we can continue the downward trend in death and injury rates and devastating financial losses which result from fire.

Thank you.

TESTIMONY
BEFORE THE
SUBCOMMITTEE ON INVESTMENT, JOBS AND PRICES
OF THE
JOINT ECONOMIC COMMITTEE
ON
REDUCED FEDERAL COMMITMENT TO HEALTH & SAFETY PROGRAMS
JULY 28, 1986

FIREFIGHTERS
FEDERAL
ASSOCIATION
ORGANIZED
NOV. 23, 1982

BY THE
FEDERAL FIREFIGHTERS ASSOCIATION

MR. CHAIRMAN, DISTINGUISHED MEMBERS OF THE JOINT ECONOMIC COMMITTEE'S SUB-COMMITTEE ON INVESTMENT, JOBS AND PRICES, MY NAME IS LYNN D. GILROY AND I AM THE SECRETARY/TREASURER OF THE FEDERAL FIREFIGHTERS ASSOCIATION, A LABOR UNION THAT REPRESENTS FEDERAL FIREFIGHTERS THAT WORK ON FEDERAL INSTALLATIONS.

I WOULD LIKE TO TAKE THIS OPPORTUNITY TO THANK YOU FOR ALLOWING US TO TESTIFY BEFORE THIS COMMITTEE ON THE VERY SERIOUS ISSUE AT HAND.

IT IS THE POSITION OF THE FEDERAL FIREFIGHTERS ASSOCIATION THAT THE FEDERAL GOVERNMENT HAS A VERY IMPORTANT ROLE TO PLAY IN THE SETTING OF STANDARDS FOR THE STATE, COUNTY AND MUNICIPAL GOVERNMENTS, IN THE AREA OF FIRE PREVENTION, PROTECTION, RESEARCH AND SAFETY. THE FEDERAL GOVERNMENT MUST BE A LEADER IN THESE FIELDS AS WELL AS THE EMERGENCY MEDICAL SERVICES FIELD, AND IT MUST BE A LEADER IN ESTABLISHING AND SETTING UP FIRE FREE ENVIRONMENTS IN THE HOMES AND WORK SITES OF IT'S PEOPLE.

WITH THE WORK THAT IS BEING ACCOMPLISHED BY THE U.S. FIRE ADMINISTRATION, OF PROVIDING EXPOSURE TO NOT ONLY FIREFIGHTERS, BUT TO THE PUBLIC, OF THE LATEST TECHNOLOGY OF HOME SPRINKLER SYSTEMS AND THE INSTALLATION OF EARLY WARNING DEVICES (SMOKE DETECTORS). IT SHOULD BE THE WORK OF THE GOVERNMENT TO CONTINUE TO BETTER IMPROVE THESE AREAS THROUGH THE EFFORTS OF THIS AGENCY AND IN CO-OPERATION WITH THE NATIONAL BUREAU OF STANDARDS AND THE

CENTER FOR FIRE RESEARCH.

WITHIN THE LAST SEVERAL YEARS IT HAS BEEN THE POSITION OF THE CURRENT ADMINISTRATION TO ZERO BUDGET THESE AGENCIES AND THEREFORE ELIMINATE THEIR EXISTENCE. THIS WOULD HAVE BEEN A TRAGEDY FOR ALL THE CITIZENS OF THIS NATION. ESPECIALLY WHEN TECHNOLOGY IS IMPROVING, AND SO MUCH WORK IS BEING DONE TO INCREASE THE KNOWLEDGE OF THIS NATION'S FIREFIGHTERS AND THE PUBLIC ON THIS TECHNOLOGY.

WE REALIZE THAT THE UNCERTAINTY OF THE GRAMM-RUDMAN AMENDMENT PLACES THESE AS WELL AS OTHER AGENCIES IN JEOPARDY, BUT IT IS OUR OPINION AND POSITION THAT THESE AGENCIES SHOULD BE FULLY FUNDED TO DO THE FUNCTION THAT THEY WERE SET OUT TO DO. IF NOT, ALL THE TRAINING, RESEARCH AND STANDARDS WILL ALL BUT BE IGNORED AND WHAT WE HAVE WORKED SO HARD FOR OVER THE YEARS WILL BE WHISKED AWAY WITH ONE FELL SWOOP, MAYBE NEVER TO BE REGAINED AGAIN.

ANOTHER AREA OF GREAT CONCERN TO US AND OUR MEMBERSHIP IS THE WHOLESALE CONTRACTING OUT OF FIRE FIGHTING FUNCTIONS WITHIN THE FEDERAL GOVERNMENT. THIS ASSOCIATION HAS BEEN FIGHTING CONTRACTING OUT, IN DEFENSE INSTALLATIONS FOR MANY YEARS, AND WITH THE HELP OF THE CONGRESS MORATORIUMS STOPPING SUCH CONTRACTING OUT HAVE BEEN ACCOMPLISHED. HOWEVER, WE FIND THAT THE VETERANS ADMINISTRATION AND THE COAST GUARD ARE IN FULL SWING TO CONTRACT OUT THEIR FIREFIGHTERS, AT THIS VERY MOMENT. WE FEEL

THAT THIS IS PENNY WISE AND POUND FOOLISH. THE FEDERAL FIREFIGHTERS OF THIS COUNTRY HAVE BEEN PROVIDING AN OUTSTANDING SERVICE, FOR A LOW COST, FOR MANY, MANY YEARS. THEY ARE HIGHLY TRAINED PROFESSIONALS. MANY OF THEM HAVE SPENT NUMEROUS HOURS AND THEIR OWN MONEY TO RECEIVE TRAINING AT THE NATIONAL FIRE ACADEMY AND OTHER STATE AND COUNTY TRAINING FACILITIES, WITH NO COMPENSATION FOR THEIR ADDED KNOWLEDGE. THEY ARE PENALIZED, BY A REDUCTION IN PAY, WHEN THEY TAKE A PROMOTION, BECAUSE OF AN ANTIQUATED PAY SYSTEM THAT IS NOT COMPARABLE TO THE JURISDICTIONS THAT SURROUND THEM, AND THEN TO SAY TO THEM THAT YOU ARE GOING TO GIVE THEIR JOB TO THE LOWEST BIDDER IS JUST ANOTHER SLAP IN THE FACE. IT IS NO WONDER THAT THERE ARE RECRUITMENT AND RETENTION PROBLEMS NOW WITHIN THE FEDERAL FIRE SERVICE.

WITH THE ALMOST CERTAIN CUTS IN MANNING OF FIRE DEPARTMENT APPARATUS BOTH IN THE FEDERAL SECTOR AS WELL AS THE COUNTIES AND MUNICIPALITIES THERE IS AN EVER INCREASING NEED TO USE ALL AVAILABLE RESOURCES WISELY AND EFFICIENTLY, AS WELL AS EFFECTIVELY.

I WONDER HOW MANY CITY OR COUNTY FIRE CHIEFS ARE GOING TO SEND THEIR PERSONNEL ON TO A FEDERAL INSTALLATION TO ASSIST A CONTRACTOR FIGHT A FIRE KNOWING THAT HE IS USING THEIR SERVICES TO HELP HIM MAKE A PROFIT. AT THIS TIME THERE ARE RECIPROCAL MUTUAL AID AGREEMENTS BETWEEN THE U.S GOVERNMENT AND THE CITIES AND COUNTIES. THESE AGREEMENTS WOULD BE NULL AND VOID WHEN A

CONTRACTOR TAKES OVER. HOW MANY BUILDINGS, ON FEDERAL INSTALLATIONS DO WE LOOSE BEFORE WE BREAK EVEN ON THE SO CALLED SAVINGS? HOW MANY LIVES DO WE LOOSE?

IN CLOSING WE WOULD LIKE TO SAY THAT THE MOOD OF FEDERAL EMPLOYEES, WITHIN THE FEDERAL FIRE SERVICE IS POOR, THE EQUIPMENT, MANNING AND LACK OF A ADEQUATE PAY SYSTEM IS DEPLORABLE FOR THE HOURS THAT ARE PUT IN. THE PEOPLE THAT WE HAVE IN THE SYSTEM ARE DEDICATED TO THE FIRE SERVICE IN GENERAL BUT THEY ARE LOOSING GROUND BECAUSE OF THE MOOD OF THE AGENCIES AND THE CURRENT ADMINISTRATION TOWARDS THEM. WE HOPE THAT THE TIDE WILL TURN SOON, BEFORE IT IS TOO LATE.

THANK YOU AGAIN MR. CHAIRMAN FOR ALLOWING US TO TESTIFY BEFORE THIS COMMITTEE.

AMERICA BURNING

The Report of The National Commission on Fire Prevention and Control

MINORITY REPORT

Minority Report of Anne Wight Phillips, M.D., Harvard Medical School, Massachusetts General and Youville Hospitals.

TO KEEP THEM SAFE

A Tribute.—This minority of the National Commission on Fire Prevention and Control commends the President and the Congress for their concern for public safety and wishes to express her esteem for the dedicated majority of the Commission with some of whose recommendations she concurs although taking the liberty of disagreeing with others.

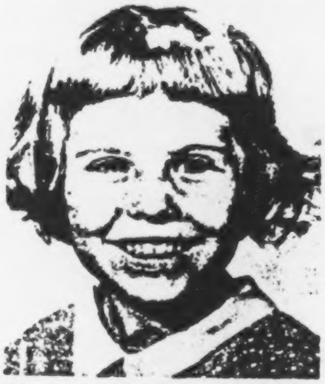

FIGURE 1

I am indebted to Patty and her parents for permission to present this series of pictures, which emphasise, more adequately than words can tell, the urgency of our fire problem. This picture was taken at age 8, before her burn injury.

Top photo by Frank Kelly, Boston Herald American

MINORITY REPORT OF COMMISSIONER ANNE W. PHILIPS, M.D.

Mr. President and Members of the Congress of the United States:

This minority, although endorsing many of the conclusions and recommendations of the majority of the Commission, cannot approve the following:

I. The magnitude of the projected budget for the majority's program ($153,090,000)
II. The location of responsibility for all of the nation's fire problems within a single agency and department
III. The proposed paramount objective for the new U.S. Fire Administration and the resulting distribution of resources recommended
IV. The proposed interim budget for the National Bureau of Standards

I. The Minority Opposes the Projected Budget

The saving of a single life is not justified, if for the same expenditure of funds and effort, it is possible to save more than one. Neither in direction nor magnitude can I support the majority's projected budget, for I believe that the saving in lives, property, and human suffering, which would be achieved by the Commission majority's program, can be equalled or exceeded with a significantly smaller budget.

II. The Minority Opposes the U.S. Fire Administration

At the end of the first half year as a member of the Commission I was in favor of the creation of a single Federal agency to coordinate the activities of all agencies concerned with fire in the Federal Government. The need for careful planning for the Nation's fire programs and the prospect of economy through reduced duplication and administrative overhead seemed to justify it. Reluctantly, I have come to take the opposite position for the following reasons:

1. Likelihood of neglect of important aspects of the fire problem

In whatever department the proposed U.S. Fire Administration settles, it must, inevitably, (unless it is very large) lack expert knowledge and special interest in those fire problems, which are primarily concerned with the interests of other Federal departments. Even with the best of intentions, needed programs outside the major thrust of the Administration and the interests of the chosen department will be down-graded or neglected, receiving less attention and funding than they merit—in part because the department and the administration will not have the background to see their importance and in part because the outside department will have less interest in pursuing fire programs, considering them Fire Administration matters.

Judging from the proposed budget, this downgrading process has already begun.

2. Limited national resources

At its first meeting, the National Commission on Fire Prevention and Control unanimously adopted as its objective the reduction of the losses of life and property from destructive fires. A glance at the majority's proposed budget will indicate that any prospects of financial savings, due to better administration or wasteful duplication, may be of fleeting benefit in the face of the high costs of the proposed programs, some of which may have little impact on the losses of life and property from destructive fires. In view of our limited resources it appears wise to spend such funds as can be made available on solutions to the fire problem, using existing agencies, rather than on creating a new administration and new demands for funds.

3. Existing agencies could make substantial strides in fire prevention and control

It is sound policy to give responsibility for any enterprise to those with special knowledge and ability in the field, but impossible in this case, since no single department has "expertise" in all aspects of the fire problem. There are many people with such specialized knowledge and ability in the various Federal departments and in the private sector, who are ready, willing, and able to go to work on reducing the Nation's fire losses. It seems the part of wisdom to use them.

4. Loss of valuable volunteer effort

It is apparent from the programs proposed for the U.S. Fire Administration that, if implemented as written, the Administration would take over many functions which are now carried out—without cost to the taxpayer—by private enterprise. This minority cannot contemplate with complacency the demise of the National Fire Protection Association, for example, which in the 78 years of its existence, has, through its fire prevention efforts, its educational programs and its life safety codes, become a world leader in the continuing war against fire. No one will ever know the number of lives, jobs, and millions of dollars worth of property saved by their endeavors.

If a U.S. Fire Administration is to be, let the enabling legislation be so drawn that maximum use is made of such private agencies. It would seem simpler and cheaper and quicker to call upon them for their expert assistance now, without the creation of a new Government agency.

5. White knight effect

The fire problem has wide ramifications—social, political, scientific, economic, and so on. The proposed multifaceted U.S. Fire Administration, by taking on all aspects of the fire problem, may, like the white knight, gallop off in all directions, spreading itself too thin to prove the master of any. It would seem that there is more to be gained by tackling smaller aspects of the problem and handling that little well.

6. The Commission recommendations run roughshod over Title I

Congress, by Title I of the Fire Research and Safety Act of 1968 (see App. I), authorized the Secretary of Commerce to conduct, directly, or through grants, fire research, educational programs, a fire information reference service, and so on. In that act Congress also assured the continuation of other existing Federal fire programs by stating that "nothing contained in this title shall be deemed to repeal, supersede, or diminish existing authority or responsibility of any agency or instrumentality of the Federal Government." Congress, therefore, after due deliberation, felt it unwise to remove all fire problems to a single department, although giving the Department of Commerce the lion's share of the responsibility. This Commission minority finds itself in agreement with them.

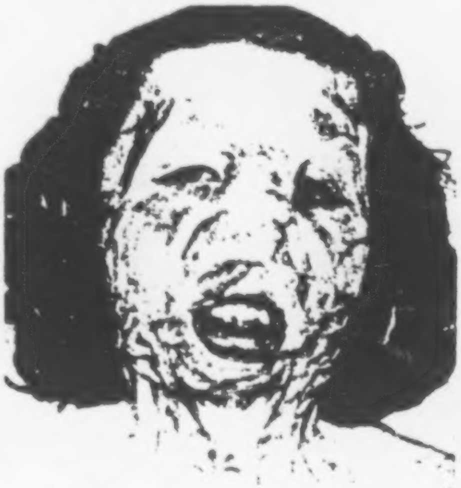

Figure 2

Patty's face on her first admission to the Shriners' Burns Institute in Galveston. She underwent more than 3 months of reconstructive surgery, costing approximately $27,000. (The darkening of her hair at this age is normal for her family coloring). Figure 3 shows her appearance after many operations.

7. Inevitable delay

Statistics tell us that 300,000 children are going to be seriously burned in this country in the next 2 years. Their suffering depends upon our speed (Figs. 1, 2, and 3). Admittedly, we are never going to prevent all fire accidents, but there is sound evidence that many of the victims can be spared if fire safety education programs are promptly initiated. With swift and adequate funding, the Department of Commerce might have the multimedia education campaign recommended by the Commission well underway before hearings on the proposed U.S. Fire Administration can begin.

8. Danger of pressure from special groups

Although in the majority of instances the interests of special groups in the fire field will run parallel with the interests of the Nation, the situation should not be created where the Nation's fire interests could be subordinated to those of any special group.

III–A. The Minority Questions the Direction of Emphasis for the U.S. Fire Administration

This Commissioner believes that, if there is to be an all-encompassing U.S. Fire Administration, its paramount objective should be the same as that adopted by the Commission: *the reduction of the losses of life and property from destructive fires.* Contributing to that objective should be programs such as firesafety education for the general public, applied research to produce a safer environment, basic research on the nature of fire and smoke, their behavior and control, improved education for members of the fire service, and so on.

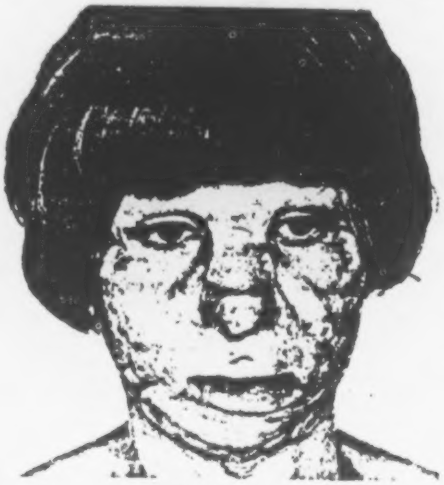

FIGURE 3.

Results after extensive plastic reconstruction. Patty wishes no further surgery at this time.

The concept set forth in Chapter 19, that assistance to local fire services should be paramount among the objectives of the proposed U.S. Fire Administration I cannot accept.

Tremendous credit should be given to the fire service for its ready acceptance of the concept that firemen should serve primarily as "fire preventers", rather than "firefighters." They will need help in changing to this new position. Even before this shift, there was a need for better education of the fire officer—better training in command, management, educational and training techniques, fire suppression, community relations, arson, and so on, to which the new emphasis on fire prevention must be added.

I believe that creation of a National Fire Academy is needed, but not as an objective ranking higher than all others. If a secondary objective is to be assigned, let it be to knowledge—new knowledge through research and dissemination of existing knowledge. *Widespread public education in fire safety principles should be our first concern.*

There is an old saying in the fire service, cited in the Commission report, that "The three principal causes of fire are men, women, and children." Statistics bear this out, making it crystal clear that most deaths, most injuries, and most fires are caused by people. Since people are the cause of the overwhelming majority of fires, it is reasonable to believe that people must be included in the solution.

Much can be done by making clothing fire resistant and by installing automatic extinguishing systems and early detection systems—there have been no recorded instances of multiple deaths in buildings fully equipped with operational sprinklers, for example—but man can, and does, circumvent the devices installed for his protection, painting over sprinkler heads, propping open smoke and fire doors and putting a penny in the fuse box. There is no substitute for understanding how to prevent fires and what to do when fires occur.

What do Americans Know About Fire Safety?

In the first months of the Commission's existence, a search was made for data on the American public's knowledge of fire safety principles. Surprisingly, the only studies discovered were made after small fire education campaigns. No one had probed our citizens' basic fire knowledge.

Since an incredible delay is necessitated by Federal restrictions on questionnaires, a survey of our citizens' knowledge was undertaken independently of the Commission and without its financial support. Initially several hundred adults and children around the Nation were interviewed. Then a questionnaire was devised and is now being used in schools, together with an answer sheet, so that students can learn, while correcting their own papers. A copy of the questions will be found in Figure 4, should the reader wish to sample his or her own firesafety knowledge before reading further. The answers appear at the end of this minority report.

Figure 4

FIRE SAFETY QUESTIONNAIRE

Student ☐ Fire Safety Teacher ☐ Age ——
Schooling: Public ☐
Private ☐
Teacher ☐ Previous Fire Training, ——————
Where (if any) school, Scouts, Army, industry, etc.
Address: —————— Sex: Male ☐ Female ☐
City State

1. If your house began to fill up with thick, black smoke, what would you do? (answer fully)
2. What would you do if you woke up at night, smelled, smoke, and found that your bedroom door was shut, but hot when you touched it?
3. Will the clothing you have on now burn?
4. What would you do right now if your clothing caught on fire?
5. If you were trapped in a bedroom on the fifth floor with flames outside in the hall and smoke pouring in under the door (with no telephone and no fire escape), what would you do?
6. (a) When you go to a strange place (movie house, friend's house for the night, hotel, restaurant, etc.), do you check to see where the exits or fire escapes are?
   (b) If the answer to 6(a) was "Yes," do you depend on being able to see the exit to find it, or do you figure out how to find it in the dark or in thick smoke?
7. Do you have a family escape plan, including ways of getting out of your house if the stairs or doors are blocked by fire, *and a meeting place* outside the house?
8. What should you do (or should your wife or mother do) if the frying pan catches on fire?
9. Carbon monoxide is produced by almost all fires. What effect does it have on you before it makes you sleepy and kills you?
10. Assume you plan to hang by your hands from a window ledge and then drop to the earth below. Estimate in feet the distance you could drop and still have a 50:50 chance of surviving without serious injury.
11. (a) What is the reason for having fuses in an electric circuit?
    (b) What strength fuse should be used in an ordinary lighting circuit?
12. What number should you dial to report a fire by telephone, and how should you report it?
13. When is an electric cord dangerous? (give at least two examples)
14. When is a double plug dangerous?
15. What should you do if you discover a large fire in your basement?
16. If you are trying to light a gas oven or burner and the first match goes out too soon, what should you do?
17. What is meant by "spontaneous combustion" or "spontaneous ignition"?
18. How should you store oily or greasy rags?
19. Why should gasoline be stored only in metal cans with self-closing caps?
20. Should you put out an electric fire with water?

Limited Survey Finds Alarming Voids in Public Fire Safety Knowledge

Data from 2,109 Americans of all ages from Maine to Florida and New York to California follows.[2] It would be presumptuous to generalize from this small sampling to the Nation as a whole, but thus far the findings have been surprisingly consistent from State to State and from one school district to another.

Less than 30, out of every 100 teenagers questioned, knew that in the presence of smoke they should stoop low or crawl out of the fire area.

Half of the youngsters from 7 to 18 questioned would do something dangerous if the frying pan caught fire, attempting to carry it or throw water on it. Teenagers were no more knowledgeable than children from 7 through 12.

Over 500 people questioned did not know that opening a hot door during a fire would almost certainly expose them to heat above human tolerance. This group included 44 out of 177 teachers.

Almost no children under seven knew that they should drop and roll if their clothing caught fire.

Very few families had a well thought out escape plan, including a predesignated meeting place outside the house.

Three-quarters of the adults questioned recommended the use of too strong a fuse for an ordinary lighting circuit.

Asked what they would do if trapped in a fifth floor room with flames outside in the hall and smoke pouring in under the door (with no telephone and no fire escape), only 3 out of 10, old or young, thought to stuff anything into the death-dealing crack. Some, of all ages, including teachers, said they would jump.

39, out of every 100 adults questioned, would react dangerously if their clothing ignited, many failing to comprehend the speed with which fire can spread to the neck and shoulders from the trouser cuff or hemline (Fig. 5).

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[1] This Commissioner has paid for all printing and most of the postage from her own limited resources. She is indebted to Harvard Medical School for a small supplementary outlay for postage.

[2] The author of this report wishes to express profound gratitude for assistance in this survey rendered by Chief Robert Ely of Kirkland, Wash., and Chief Merrill Hendricks of Dallas, Tex.

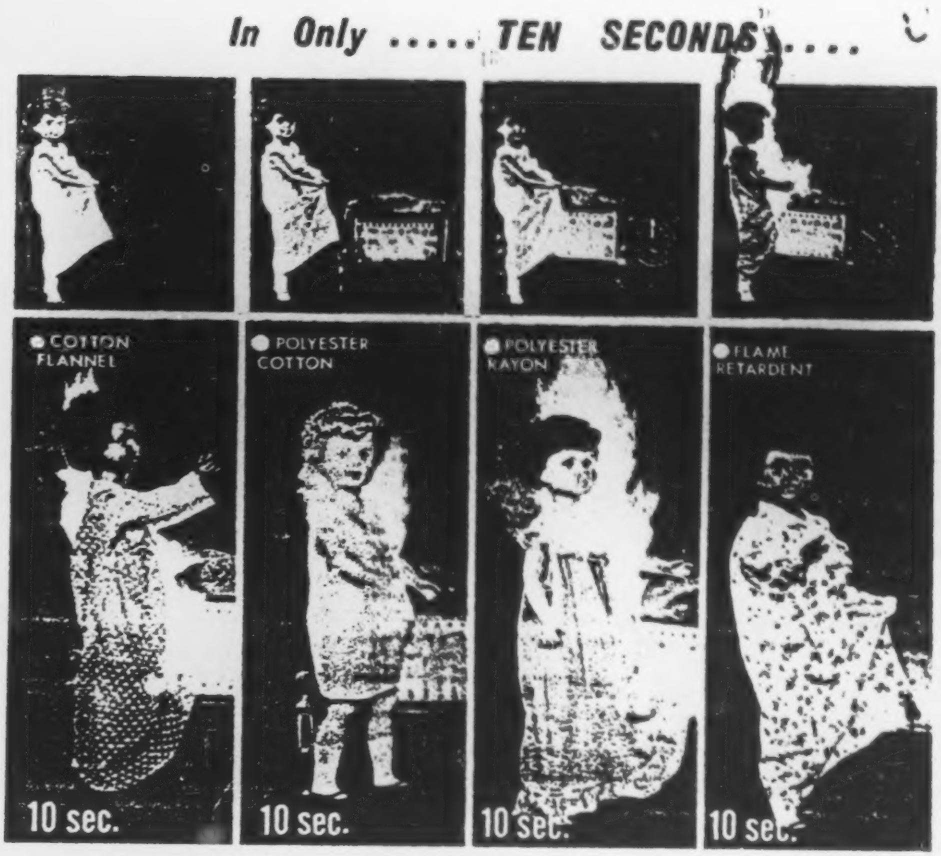


FIGURE 5

The need for public fire safety education is clear. That it can be effective is documented by the Commission in Chapter 15. Other evidence is available. Hopefully, my objection to the direction proposed for the U.S. Fire Administration now appears justified.

What of the budget?

III–B. The Minority Opposes the Budget Allocations

My main objections to the proposed budget are threefold:

1. Proposed budget is not responsive to the concerns of the Nation's fire chiefs.—In the early days of this Commission, a questionnaire was sent out to fire chiefs throughout the Nation. Replies from 10,000 chiefs have been tabulated. Under the heading "Evaluation of Fire Department Problems" the chiefs were asked to rank "in order from most serious to least serious" the problem areas of concern to them. Unselfishly, the chiefs gave top ranking to "lack of effective public education on fire safety." Inadequate training and education for fire service personnel was listed eighth and the need for improved fire department apparatus and personnel protective equipment ninth. The proposed budget fails to reflect their considered opinions.

2. *Need for pilot projects.*—The majority of the Commission has recommended that every local fire jurisdiction prepare a master plan designed to meet the community's present and future needs, and $30 million are budgeted for local master plan development. Similarly $15 million have been set aside for equipment upgrading and $10 million for detection and alarm systems and built-in protection loan insurance. We do not know whether these programs will reduce the losses of life and property from destructive property. These, and untried educational programs, should be tested on a local or regional basis through pilot projects, before investing large amounts of money on their implementation nationwide. Training of burn specialists should likewise, precede the development of burn centers.

3. *Inadequate provisions for public education.*—The budget allotment for public education will not produce the type of program the Commisison has envisioned in chapter 15. There are 25 million children in this Nation between kindergarten and sixth grade. The $6 million specified for elementary school education on chart 15.2 is estimated by both private and Government experts to be insufficient to put one piece of effective material in the hands of each school child. Ten million would be required to supply effective graded materials to each of the Nation's 1.3 million elementary school teachers. Other means, such as using existing films and visual aids, close-circuit TV, etc. should be explored, but it seems unlikely that the proposed budget will be adequate to achieve the desired results.

IV. Minority Finds Interim Budget Insufficient

The setting of the interim budget at $3 million for research and engineering programs fairly well precludes the National Bureau of Standards from acting in accordance with most of its mandate under Title I during the next year or two. Assigned an inadequate budget of $5 million at the outset and underfunded at that, it can be reasonably expected to continue to do only those things for which it has the greatest research and engineering ability. The NIFE program (National Inventory of Fire Experience) for cooperative effort between the Bureau of Standards and the National Fire Protection Association will probably be left in abeyance because of the uncertainty of its future. If a national fire data system is to be set up under the U.S. Fire Administration, and essentially independent of them both, there may be little initiative to go forward.

Almost certainly 2 years and more will pass before any real Federal fire safety education program is undertaken (whether through grants or otherwise), while week after week more Pattys are carried into the Nation's hospitals (Figs. 2 & 3).

DISCUSSION

I. Budget

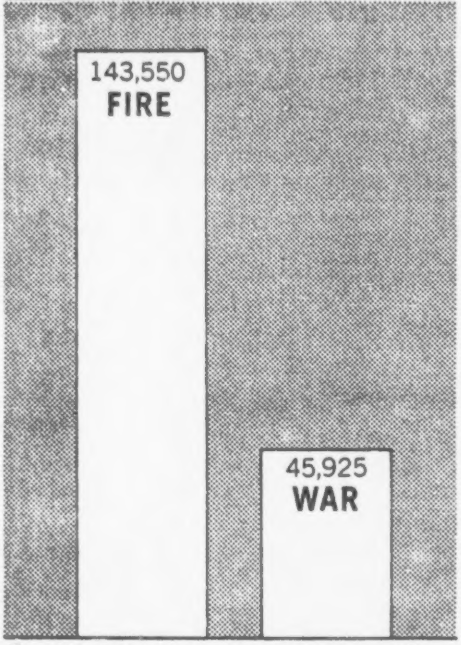
Although in my opinion the total budget proposed by the majority of the Commission is too big, yet what has been spent on fire prevention and control by the Federal Government in the past is too small.

II. Measures To Reduce Injuries and Loss of Life and Property From Destructive Fires

It is the conviction of this minority that ***without a continuing massive program to educate the public in simple fire safety measures, a substantial reduction in our tragic American fire toll cannot be expected.*** The principal measures recommended to save lives, suffering and property are:

1. A massive multimedia, recipient-oriented public education campaign.
2. Fire education in the schools.

FIGURE 6 Deaths – U.S. Fires vs. Vietnam War



Comparisons of deaths in U.S. military personnel (Army, Navy, Coast Guard, Marine Corps, and Air Force) resulting from actions by hostile forces in Vietnam, 1961 through 1972, and deaths from U.S. fires for the same period (Statistics from the Department of Defense and the National Fire Protection Association).

3. Fire department involvement in fire safety education of commercial, industrial, and institutional personnel and in an optional inspection program for dwellings.

4. Development of a reliable and inexpensive smoke and fire detection system for dwellings.

5. Reduction of the hazards of flammable wearing apparel.

6. Use of noncombustible interior finish materials in residences and places of business and assembly.

7. Complete automatic fire extinguishing systems for homes (and hospitals) for the incapacitated and for high-rise buildings.

8. A program of fire safety training for the health educator aides of the Department of Health, Education, and Welfare, who, because of their rapport with the residents of high-risk areas may be able to teach fire safety principles on a person to person basis.

9. Increased research on smoke and smoke inhalation injury which is responsible for more than half of the Nation's fire deaths.

III. Principal Measures To Improve the Fire Services

1. Establishment of a National Fire Academy.

2. Research on better engineering of breathing apparatus and protective clothing.

3. Federal support for State and local fire *inspection* programs.

Minority Recommendations

1. Continued support of existing fire programs in the Federal Government.

2. Reduction of the projected total additional fire budget by $100 million during the build-up years and $75 million during the operating years, subject to subsequent review.

3. Retention of the Department of Commerce as the principal focus for the Federal fire effort, in accordance with the provisions of Title I of the Fire Research and Safety Act of 1968.

4. Swift and adequate funding of the Department of Commerce to permit early institution of a massive, multimedia fire safety education campaign.

5. Enactment of new legislation to assign responsibility, for direct support to the fire services, to the Department of Housing and Urban Development, including the establishment of a national fire academy.

6. Creation of a new temporary Commission in 1983 to assess the effectiveness of the Federal fire programs and make recommendations to the President and the Congress for further steps to diminish the Nation's annual toll from fire.

7. Increased use of the oversight function of the appropriate committees to assure assessment of effectiveness and adequate planning by the departments during the interim.

This minority opposes the creation of a new Federal fire agency at this time. During the proposed review in 1983 it would be appropriate to consider whether the Nation's interests would be better served by the establishment of a Federal agency for fire research and education in the Department of Commerce.

This minority urges the President and the Congress in considering these recommendations and those of the majority of the Commission, to use as your yardstick, the probable reduction of life and property losses if the measures suggested are adopted.

In conclusion, I support the position of the majority of the Commission that expanded Federal action is needed in the fire field and that, properly directed, the investment will pay off handsomely. A few final words may emphasize the need:

As grim as were our losses due to enemy action in Vietnam, they were small compared with our Nation's fire casualties for the same period (Fig. 6). Smoke and fire seriously injure 300,000 Americans every year and kill nearly 12,000. How many are 12,000? How many people could you call by name if you met them on the street? 2,000? 4,000? In this Nation, fire and smoke kill more people each and every year than the average person knows and gravely injures more than he has ever met.

Respectfully submitted,

ANNE WIGHT PHILLIPS.

SELF-SCORING THE FIRE SAFETY QUESTIONNAIRE

Questions	*Safety score (points)*
Question 1. If your house began to fill up with thick, black smoke, what would you do? (answer fully)	
If your answer included getting beneath the smoke by crouching or crawling (to evade harmful combustion products), give yourself	3
If your answer included getting out of the house, give yourself	3
If your answer included rousing the rest of the household, give yourself	3
If your answer included calling the first department, give yourself	3
If your answer included opening windows without first closing doors (to keep the air from the fire) subtract 3 points	
Question 2. What would you do if you woke up at night, smelled smoke, and found that your bedroom door was shut, but hot when you touched it?	
If your answer did not include opening the hot door (which would expose you to killing heat), give yourself	4
If your answer included calling for help by phone or from a window, or finding an alternative way out, give yourself	3

APPENDIX I

PUBLIC LAW 90-259

(90th Congress, S. 1124, Mar. 1, 1968)

AN ACT

To amend the Organic Act of the National Bureau of Standards to authorize a fire research and safety program, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Fire Research and Safety Act of 1968".

TITLE I—FIRE RESEARCH AND SAFETY PROGRAM

DECLARATION OF POLICY

Sec. 101. The Congress finds that a comprehensive fire research and safety program is needed in this country to provide more effective measures of protection against the hazards of death, injury, and damage to property. The Congress finds that it is desirable and necessary for the Federal Government, in carrying out the provisions of this title, to cooperate with and assist public and private agencies. The Congress declares that the purpose of this title is to amend the Act of March 3, 1901, as amended, to provide a national fire research and safety program including the gathering of comprehensive fire data; a comprehensive fire research program; fire safety education and training programs; and demonstrations of new approaches and improvements in fire prevention and control, and reduction of death, personal injury, and property damage. Additionally, it is the sense of Congress that the Secretary should establish a fire research and safety center for administering this title and carrying out its purposes, including appropriate fire safety liaison and coordination.

AUTHORIZATION OF PROGRAM

Sec. 102. The Act entitled "An Act to establish the National Bureau of Standards", approved March 3, 1901, as amended (15 U.S.C. 271–278e), is further amended by adding the following sections:

"Sec. 16. The Secretary of Commerce (hereinafter referred to as the 'Secretary') is authorized to—

"(a) Conduct directly or through contracts or grants—

"(1) investigations of fires to determine their causes, frequency of occurrence, severity, and other pertinent factors;

"(2) research into the causes and nature of fires, and the development of improved methods and techniques for fire prevention, fire control, and reduction of death, personal injury, and property damage;

"(3) educational programs to—

"(A) inform the public of fire hazards and fire safety techniques, and

"(B) encourage avoidance of such hazards and use of such techniques;

"(4) fire information reference services, including the collection, analysis, and dissemination of data, research results, and other information, derived from this program or from other sources and related to fire protection, fire control, and reduction of death, personal injury, and property damage;

"(5) educational and training programs to improve, among other things—

"(A) the efficiency, operation, and organization of fire services, and

"(B) the capability of controlling unusual fire-related hazards and fire disasters; and

"(6) projects demonstrating—

"(A) improved or experimental programs of fire prevention, fire control, and reduction of death, personal injury, and property damage,

"(B) application of fire safety principles in construction, or

"(C) improvement of the efficiency, operation, or organization of the fire services.

"(b) Support by contracts or grants the development, for use by educational and other nonprofit institutions, of—

"(1) fire safety and fire protection engineering or science curriculums; and

"(2) fire safety courses, seminars, or other instructional materials and aids for the above curriculums or other appropriate curriculums or courses of instruction.

"Sec. 17. With respect to the functions authorized by section 16 of this Act—

"(a) Grants may be made only to States and local governments, other non-Federal public agencies, and nonprofit institutions. Such a grant may be up to 100 per centum of the total cost of the project for which such grant is made. The Secretary shall require, whenever feasible, as a condition of approval of a grant, that the recipient contribute money, facilities, or services to carry out the purpose for which the grant is sought. For the purposes of this section, 'State' means any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Canal Zone, American Samoa, and the Trust Territory of the Pacific Islands; and 'public agencies' includes combinations or groups of States or local governments.

"(b) The Secretary may arrange with and reimburse the heads of other Federal departments and agencies for the performance of any such functions, and, as necessary or appropriate, delegate any of his powers under this section or section 16 of this Act with respect to any part thereof, and authorize the redelegation of such powers.

"(c) The Secretary may perform such functions without regard to section 3648 of the Revised Statutes (31 U.S.C. 529).

"(d) The Secretary is authorized to request any Federal department or agency to supply such statistics, data, program reports, and other materials as he deems necessary to carry out such functions. Each such department or agency is authorized to cooperate with the Secretary and, to the extent permitted by law, to furnish such materials to the Secretary. The Secretary and the heads of other departments and agencies engaged in administering programs related to fire safety shall, to the maximum extent practicable, cooperate and consult in order to insure fully coordinated efforts.

"(e) The Secretary is authorized to establish such policies, standards, criteria, and procedures and to prescribe such rules and regulations as he may deem necessary or appropriate to the administration of such functions or this section, including rules and regulations which—

"(1) provide that a grantee will from time to time, but not less often than annually, submit a report evaluating accomplishments of activities funded under section 16, and

"(2) provide for fiscal control, sound accounting procedures, and periodic reports to the Secretary regarding the application of funds paid under section 16."

NONINTERFERENCE WITH EXISTING FEDERAL PROGRAMS

SEC. 103. Nothing contained in this title shall be deemed to repeal, supersede, or diminish existing authority or responsibility of any agency or instrumentality of the Federal Government.

AUTHORIZATION OF APPROPRIATIONS

SEC. 104. There are authorized to be appropriated, for the purposes of this Act, $5,000,000 for the period ending June 30, 1970.

TITLE II—NATIONAL COMMISSION ON FIRE PREVENTION AND CONTROL

FINDINGS AND PURPOSE

SEC. 201. The Congress finds and declares that the growing problem of the loss of life and property from fire is a matter of grave national concern; that this problem is particularly acute in the Nation's urban and suburban areas where an increasing proportion of the population resides but it is also of national concern in smaller communities and rural areas; that as population concentrates, the means for controlling and preventing destructive fires has become progressively more complex and frequently beyond purely local capabilities; and that there is a clear and present need to explore and develop more effective fire control and fire prevention measures throughout the country in the light of existing and foreseeable conditions. It is the purpose of this title to establish a commission to undertake a thorough study and investigation of this problem with a view to the formulation of recommendations whereby the Nation can reduce the destruction of life and property caused by fire in its cities, suburbs, communities, and elsewhere.

ESTABLISHMENT OF COMMISSION

SEC. 202. (a) There is hereby established the National Commission on Fire Prevention and Control (hereinafter referred to as the "Commission") which shall be composed of twenty members as follows: the Secretary of Commerce, the Secretary of Housing and Urban Development, and eighteen members appointed by the President. The individuals so appointed as members (1) shall be eminently well qualified by training or experience to carry out the functions of the Commission, and (2) shall be selected so as to provide representation of the views of individuals and organizations of all areas of the United States concerned with fire research, safety, control, or prevention, including representatives drawn from Federal, State, and local governments, industry, labor, universities, laboratories, trade associations, and other interested institutions or organizations. Not more than six members of the Commission shall be appointed from the Federal Government. The President shall designate the Chairman and Vice Chairman of the Commission.

(b) The Commission shall have four advisory members composed of—

(1) two Members of the House of Representatives who shall not be members of the same political party and who shall be appointed by the Speaker of the House of Representatives, and

(2) two Members of the Senate who shall not be members of the same political party and who shall be appointed by the President of the Senate.

The advisory members of the Commission shall not participate, except in an advisory capacity, in the formulation of the findings and recommendations of the Commission.

(c) Any vacancy in the Commission or in its advisory membership shall not affect the powers of the Commission, but shall be filled in the same manner as the original appointment.

DUTIES OF THE COMMISSION

SEC. 203. (a) The Commission shall undertake a comprehensive study and investigation to determine practicable and effective measures for reducing the destructive effects of fire throughout the country in addition to the steps taken under sections 16 and 17 of the Act of March 3, 1901 (as added by title I of this Act). Such study and investigation shall include, without being limited to—

(1) a consideration of ways in which fires can be more effectively prevented through technological advances, construction techniques, and improved inspection procedures;

(2) an analysis of existing programs administered or supported by the departments and agencies of the Federal Government and of ways in which such programs could be strengthened so as to lessen the danger of destructive fires in Government-assisted housing and in the redevelopment of the Nation's cities and communities;

(3) an evaluation of existing fire suppression methods and of ways for improving the same, including procedures for recruiting and soliciting the necessary personnel;

(4) An evaluation of present and future needs (including long-term needs) of training and education for fire-service personnel;

(5) a consideration of the adequacy of current fire communication techniques and suggestions for the standardization and improvement of the apparatus and equipment used in controlling fires;

(6) an analysis of the administrative problems affecting the efficiency or capabilities of local fire departments or organizations; and

(7) an assessment of local, State, and Federal responsibilities in the development of practicable and effective solutions for reducing fire losses.

(b) In carrying out its duties under this section the Commission shall consider the results of the functions carried out by the Secretary of Commerce under sections 16 and 17 of the Act of March 3, 1901 (as added by title I of this Act), and consult regularly with the Secretary in order to coordinate the work of the Commission and the functions carried out under such sections 16 and 17.

(c) The Commisison shall submit to the President and to the Congress a report with respect to its findings and recommendations not later than two years after the Commission has been duly organized.

POWERS AND ADMINISTRATIVE PROVISIONS

SEC. 204. (a) The Commission or, on the authorization of the Commission, any subcommittee or member thereof, may, for the purpose of carrying out the provisions of this title, hold hearings, take testimony, and administer oaths or affirmations to witnesses appearing before the Commission or any subcommittee or member thereof.

(b) Each department, agency, and instrumentality of the executive branch of the Government, including an independent agency, is authorized to furnish to the Commission, upon request made by the Chairman or Vice Chairman, such information as the Commission deems necessary to carry out its functions under this title.

(c) Subject to such rules and regulations as may be adopted by the Commssion, the Chairman, without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, shall have the power—

(1) to appoint and fix the compensation of such staff personnel as he deems necessary, and

(2) to procure temporary and intermittent services to the same extent as is authorized by section 3109 of title 5, United States Code.

COMPENSATION OF MEMBERS

SEC. 205. (a) Any member of the Commission, including a member appointed under section 202 (b), who as a Member of Congress or in the executive branch of the Government shall serve without compensation in addition to that received in his regular employment, but shall be entitled to reimbursement for travel, subsistence, and other necessary expenses incurred by him in connection with the performance of duties vested in the Commission.

(b) Members of the Commission, other than those referred to in subsection (a), shall receive compensation at the rate of $100 per day for each day they are engaged in the performance of their duties as members of the Commission and shall be entitled to reimbursement for travel, subsistence, and other necessary expenses incurred by them in the performance of their duties as members of the Commission.

EXPENSES OF THE COMMISSION

SEC. 206. There are authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, such sums as may be necessary to carry out this title.

EXPIRATION OF THE COMMISSION

SEC. 207. The Commission shall cease to exist thirty days after the submission of its report under section 203(c).

Approved March 1, 1968.

Legislative history

HOUSE REPORT No. 522 accompanying H.R. 11284 (Comm. on Science and Astronautics).

SENATE REPORT No. 502 (Comm. on Commerce).

CONGRESSIONAL RECORD: Vol. 113 (1967): Aug. 16, considered and passed Senate. Vol. 114 (1968): Feb. 8, considered and passed House, amended, in lieu of H.R. 11284. Feb. 16, Senate agreed to House amendment.

APPENDIX IV

RECOMMENDATIONS OF THE NATIONAL COMMISSION ON FIRE PREVENTION AND CONTROL

Chapter 1

1. . . . the Commission recommends that Congress establish a U.S. Fire Administration to provide a national focus for the Nation's fire problem and to promote a comprehensive program with adequate funding to reduce life and property loss from fire.

2. . . . the Commission recommends that a national fire data system be established to provide a continuing review and analysis of the entire fire problem.

Chapter 2

3. The Commission recommends that Congress enact legislation to make possible the attainment of 25 burn units and centers and 90 burn programs within the next 10 years.

4. The Commission recommends that Congress, in providing for new burn treatment facilities, make adequate provision for the training and continuing support of the specialists to staff these facilities. Provision should also be made for special training of those who provide emergency care for burn victims in general hospitals.

5. The Commission recommends that the National Institutes of Health greatly augment their sponsorship of research on burns and burn treatment.

6. The Commission recommends that the National Institutes of Health administer and support a systematic program of research concerning smoke inhalation injuries.

Chapter 3

7. The Commission recommends that local governments make fire prevention at least equal to suppression in the planning of fire department priorities.

8. The Commission recommends that communities train and utilize women for fire service duties.

9. The Commission recommends that laws which hamper cooperative arrangements among local fire jurisdictions be changed to remove the restrictions.

10. The Commission recommends that every [illegible] jurisdiction prepare a master plan de-[illegible] meet the community's present and future ne[illegible] protection, to serve as a basis for progran[illegible]ting, and to identify and implement the optim[illegible] cost-benefit solutions in fire protection.

11. . . . the Commission recommends that Federal grants for equipment and training be available only to those fire jurisdictions that operate from a federally approved master plan for fire protection.

12. The Commission recommends that the proposed U.S. Fire Administration act as a coordinator of studies of fire protection methods and assist local jurisdictions in adapting findings to their fire protection planning.

Chapter 4

13. The Commission recommends that the proposed U.S. Fire Administration provide grants to local fire jurisdictions for developing master plans for fire protection. Further, the proposed U.S. Fire Administration should provide technical advice and qualified personnel to local fire jurisdictions to help them develop master plans.

Chapter 5

14. . . . the Commission recommends that the proposed U.S. Fire Administration sponsor research in the following areas: productivity measure of fire departments, job analyses, firefighter injuries, and fire prevention efforts.

15. . . . the Commission urges the Federal research agencies, such as the National Science Foundation and the National Bureau of Standards, to sponsor research appropriate to their respective missions within the areas of productivity of fire departments, causes of firefighter injuries, effectiveness of fire prevention efforts, and the skills required to perform various fire department functions.

16. The Commission recommends that the Nation's fire departments recognize advanced and specialized education and hire or promote persons with experience at levels commensurate with their skills.

17. The Commission recommends a program of Federal financial assistance to local fire services to upgrade their training.

18. In the administering of Federal funds for training or other assistance to local fire departments, the Commission recommends that eligibility be limited to those departments that have adopted an effective, affirmative action program related to the employment and promotion of members of minority groups.

19. The Commission recommends that fire departments, lacking emergency ambulance, paramedical, and rescue services consider providing them, especially if they are located in communities where these services are not adequately provided by other agencies.

CHAPTER 6

20. . . . the Commission recommends the establishment of a National Fire Academy to provide specialized training in areas important to the fire services and to assist State and local jurisdictions in their training programs.

21. The Commission recommends that the proposed National Fire Academy assume the role of developing, gathering, and disseminating, to State and local arson investigators, information on arson incidents and on advanced methods of arson investigations.

22. The Commission recommends that the National Fire Academy be organized as a division of the proposed U.S. Fire Administration, which would assume responsibility for deciding details of the Academy's structure and administration.

23. The Commission recommends that the full cost of operating the proposed National Fire Academy and subsidizing the attendance of fire service members be borne by the Federal Government.

CHAPTER 7

24. The Commission urges the National Science Foundation, in its Experimental Research and Development Incentives Program, and the National Bureau of Standards, in its Experimental Technology Incentives Program, to give high priority to the needs of the fire services.

25. The Commission recommends that the proposed U.S. Fire Administration review current practices in terminology, symbols, and equipment descriptions, and seek to introduce standardization where it is lacking.

26. The Commission urges rapid implementation of a program to improve breathing apparatus systems and expansion of the program's scope where appropriate.

27. The Commission recommends that the proposed U.S. Fire Administration undertake a continuing study of equipment needs of the fire services, monitor research and development in progress, encourage needed research and development, disseminate results, and provide grants to fire departments for equipment procurement to stimulate innovation in equipment design.

28. . . . the Commission urges the Joint Council of National Fire Service Organizations to sponsor a study to identify shortcomings of firefighting equipment and the kinds of research, development, or technology transfer that can overcome the deficiencies.

CHAPTER 8

No recommendations.

CHAPTER 9

29. The Commission recommends that research in the basic processes of ignition and combustion be strongly increased to provide a foundation for developing improved test methods.

30. This Commission recommends that the new Consumer Product Safety Commission give a high priority to the combustion hazards of materials in their end use.

31. . . . the Commission recommends that the present fuel load study sponsored by the General Services Administration and conducted by the National Bureau of Standards be expanded to update the technical study of occupancy fire loads.

32. The Commission recommends that flammability standards for fabrics be given high priority by the Consumer Product Safety Commission.

33. The Commission recommends that all States adopt the Model State Fireworks Law of the National Fire Protection Association, thus prohibiting all fireworks except those for public displays.

34. The Commission recommends that the Department of Commerce be funded to provide grants for studies of combustion dynamics and the means of its control.

35. The Commission recommends that the National Bureau of Standards and the National Institutes of Health cooperatively devise and implement a set of research objectives designed to provide combustion standards for materials to protect human life.

CHAPTER 10

36. The Commission urges the National Bureau of Standards to assess current progress in fire research and define the areas in need of additional investigation. Further, the Bureau should recommend a program for translating research results into a systematic body of engineering principles and, ultimately, into guidelines useful to code writers and building designers.

37. The Commission recommends that the National Bureau of Standards, in cooperation with the National Fire Protection Association and other appropriate organizations, support research to develop guidelines for a systems approach to fire safety in all types of buildings.

38. . . . the Commission recommends that, in all construction involving Federal money, awarding of those funds be contingent upon the approval of a fire safety systems analysis and a fire safety effectiveness statement.

39. This Commission urges the Consumer Product Safety Commission to give high priority to matches, cigarettes, heating appliances, and other consumer products that are significant sources of burn injuries, particularly products for which industry standards fail to give adequate protection.

40. The Commission recommends to schools giving degrees in architecture and engineering that they include in their curricula at least one course in fire safety. Further, we urge the American Institute of Architects, professional engineering soci-

eties, and State registration boards to implement this recommendation.

41. The Commission urges the Society of Fire Protection Engineers to draft model courses for architects and engineers in the field of fire protection engineering.

42. The Commission recommends that the proposed National Fire Academy develop short courses to educate practicing designers in the basics of fire safety design.

Chapter 11

43. The Commission recommends that all local governmental units in the United States have in force an adequate building code and fire prevention code or adopt whichever they lack.

44. The Commission recommends that local governments provide the competent personnel, training programs for inspectors, and coordination among the various departments involved to enforce effectively the local building and fire prevention codes. Representatives from the fire department should participate in reviewing the fire safety aspects of plans for new building construction and alterations to old buildings.

45. The Commission recommends that, as the model code of the International Conference of Building Officials has already done, all model codes specify at least a single-station early-warning detector oriented to protect sleeping areas in every dwelling unit. Further, the model codes should specify automatic fire extinguishing systems and early-warning detectors for high-rise buildings and for low-rise buildings in which many people congregate.

Chapter 12

46. The Commission recommends that the National Transportation Safety Board expand its efforts in issuance of reports on transportation accidents so that the information can be used to improve transportation fire safety.

47. The Commission recommends that the Department of Transportation work with interested parties to develop a marking system, to be adopted nationwide, for the purpose of identifying transportation hazards.

48. The Commission recommends that the proposed National Fire Academy disseminate to every fire jurisdiction appropriate educational materials on the problems of transporting hazardous materials.

49. The Commission recommends the extension of the Chem-Trec system to provide ready access by all fire departments and to include hazard control tactics.

50. . . . the Commission recommends that the Department of the Treasury establish adequate fire regulations, suitably enforced, for the transportation, storage, and transfer of hazardous materials in international commerce.

51. The Commission recommends that the Department of Transportation set mandatory standards that will provide fire safety in private automobiles.

52. The Commission recommends that airport authorities review their firefighting capabilities and, where necessary, formulate appropriate capital improvement budgets to meet current recommended aircraft rescue and firefighting practices.

53. The Commission recommends that the Department of Transportation undertake a detailed review of the Coast Guard's responsibilities, authority, and standards relating to marine fire safety.

54. The Commission recommends that the railroads begin a concerted effort to reduce rail-caused fires along the Nation's rail system.

55. . . . the Commission recommends that the Urban Mass Transportation Administration require explicit fire safety plans as a condition for all grants for rapid transit systems.

Chapter 13

56. . . . the Commission recommends that rural dwellers and others living at a distance from fire departments install early-warning detectors and alarms to protect sleeping areas.

57. The Commission recommends that U.S. Department of Agriculture assistance to [community fire protection facilities] projects be contingent upon an approved master plan for fire protection for local fire jurisdictions.

Chapter 14

58. . . . the Commission recommends that the proposed U.S. Fire Administration join with the Forest Service, U.S.D.A., in exploring means to make fire safety education for forest and grassland protection more effective.

59. The Commission recommends that the Council of State Governments undertake to develop model State laws relating to fire protection in forests and grasslands.

60. The Commission urges interested citizens and conservation groups to examine fire laws and their enforcement in their respective States and to press for strict compliance.

61. The Commission recommends that the Forest Service, U.S.D.A., develop the methodology to make possible nationwide forecasting of fuel buildup as a guide to priorities in wildland management.

62. The Commission supports the development of a National Fire Weather Service in the National Oceanic and Atmospheric Administration and urges its acceleration.

Chapter 15

63. The Commission recommends that the Department of Health, Education, and Welfare include in accreditation standards fire safety education in the schools throughout the school year. Only schools presenting an effective fire safety education

program should be eligible for any Federal financial assistance.

64. The Commission recommends that the proposed U.S. Fire Administration sponsor fire safety education courses for educators to provide a teaching cadre for fire safety education.

65. The Commission recommends to the States the inclusion of fire safety education in programs educating future teachers and the requirement of knowledge of fire safety as a prerequisite for teaching certification.

66. The Commission recommends that the proposed U.S. Fire Administration develop a program, with adequate funding, to assist, augment, and evaluate existing public and private fire safety education efforts.

67. . . . the Commission recommends that the proposed U.S. Fire Administration, in conjunction with the Advertising Council and the National Fire Protection Association, sponsor an all-media campaign of public service advertising designed to promote public awareness of fire safety.

68. The Commission recommends that the proposed U.S. Fire Administration develop packets of educational materials appropriate to each occupational category that has special needs or opportunities in promoting fire safety.

CHAPTER 16

69. The Commission supports the Operation EDITH (Exit Drills In The Home) plan and recommends its acceptance and implementation both individually and community-wide.

70. The Commission recommends that annual home inspections be undertaken by every fire department in the Nation. Further, Federal financial assistance to fire jurisdictions should be contingent upon their implementation of effective home fire inspection programs.

71. The Commission urges Americans to protect themselves and their families by installing approved early-warning fire detectors and alarms in their homes.

72. . . . the Commission recommends that the insurance industry develop incentives for policyholders to install approved early-warning fire detectors in their residences.

73. The Commission urges Congress to consider amending the Internal Revenue Code to permit reasonable deductions from income tax for the cost of installing approved detection and alarm systems in homes.

74. . . . the Commission recommends that the proposed U.S. Fire Administration monitor the progress of research and development on early-warning detection systems in both industry and government and provide additional support for research and development where it is needed.

75. The Commission recommends that the proposed U.S. Fire Administration support the development of the necessary technology for improved automatic extinguishing systems that would find ready acceptance by Americans in all kinds of dwelling units.

76. The Commission recommends that the National Fire Protection Association and the American National Standards Institute jointly review the Standard for Mobile Homes and seek to strengthen it, particularly in such areas as interior finish materials and fire detection.

77. The Commission recommends that all political jurisdictions require compliance with the NFPA/ANSI standard for mobile homes together with additional requirements for early-warning fire detectors and improved fire resistance of materials.

78. The Commission recommends that State and local jurisdictions adopt the NFPA Standard on Mobile Home Parks as a minimum mode of protection for the residents of these parks.

CHAPTER 17

79. The Commission strongly endorses the provisions of the Life Safety Code which require specific construction features, exit facilities, and fire detection systems in child day care centers and recommends that they be adopted and enforced immediately by all the States as a minimum requirement for licensing of such facilities.

80. The Commission recommends that early-warning detectors and total automatic sprinkler protection or other suitable automatic extinguishing systems be required in all facilities for the care and housing of the elderly.

81. The Commission recommends to Federal agencies and the States that they establish mechanisms for annual review and rapid upgrading of their fire safety requirements for facilities for the aged and infirm, to a level no less stringent than the current NFPA Life Safety Code.

82. The Commission recommends that the special needs of the physically handicapped and elderly in institutions, special housing, and public buildings be incorporated into all fire safety standards and codes.

83. The Commission recommends that the States provide for periodic inspection of facilities for the aged and infirm, either by the State's fire marshal's office or by local fire departments, and also require approval of plans for new facilities and inspection by a designated authority during and after construction.

84. The Commission recommends that the National Bureau of Standards develop standards for the flammability of fabric materials commonly used in nursing homes with a view to providing the highest level of fire resistance compatible with the state-of-the-art and reasonable costs.

85. The Commission recommends that political subdivisions regulate the location of nursing homes and housing for the elderly and require that fire

alarm systems be tied directly and automatically to the local fire department.

CHAPTER 18

86. The Commission recommends that the Federal Government retain and strengthen its programs of fire research for which no non-governmental alternatives exist.

87. . . . the Commission recommends that the Federal budget for research connected with fire be increased by $26 million.

88. . . . the Commission recommends that associations of material and product manufacturers encourage their member companies to sponsor research directed toward improving the fire safety of the built environment.

CHAPTER 19

89. . . . the Commission recommends that the proposed U.S. Fire Administration be located in the Department of Housing and Urban Development.

90. The Commission recommends that Federal assistance in support of State and local fire service programs be limited to those jurisdictions complying with the National Fire Data System reporting requirements.

CHAPTER 20

No recommendations.

APPENDIX V

1971 FIRE LOSS DATA

Category	Life loss		Property loss		Fires	
	Number	Percent of total	Million Dollars	Percent of total	Number	Percent of total
Residential (houses, apartments and hotels)	6,600	56	$874.1	31.9	699,000	25.6
Commercial (public assembly, educational, institutional, mercantile and office)	970	8	580.5	21.1	141,400	5.2
Industrial (basic industry, storage, manufacturing and miscellaneous			811.6	29.6	156,500	5.7
Building fires (total)	7,570 [1]	64	$2,266.2 [4]	82.6	996,900 [4]	36.5
Brush, rubbish, grass	(2)	(2)	(3)	(2)	1,076,300	39.5
Forest fires	20	0.2	$119.0	4.4	111,500	4.1
Other outdoor fires	(2)	(2)	26.0	0.9	22,000	0.8
Aerospace vehicles and aircraft	125	1.1	192.0	7.0	200	.....
Motor vehicles—farm/construction	3,950	33.3	16.12	0.6	19,200	0.7
Motor Vehicles—pleasure/transportation		.....	96.54	3.5	482,400	17.7
Ships, railroads, etc	185	1.5	27.60	1.0	20,000	0.7
Non-building fires (total)	4,280 [1]	36.1	$479.26 [4]	17.4	1,731,600 [4]	63.5
Grand total	11,850 [4]	100	$2,743.46 [4]	100	2,728,500 [4]	100

[1] NFPA unofficial estimate for 1971.

[2] No separate estimates; totals included in other categories.

[3] No loss assumed for this type fire.

[4] NFPA official estimate for 1971.

APPENDIX VII

ESTIMATE U.S. FIRE RESEARCH FUNDS

Sponsor	Program area	Funds (thousand)
TOTAL		$105,200
Federal Government		26,600
Atomic Energy Commission	Nuclear plant fire protection	500
Agriculture	Forest fire prevention and control, fire weather modification	5,900
Commerce	Fabric and building fire safety, fire behavior, combustion	2,600
Defense	War and disaster-related fire and countermeasures, fuel materials and ammunition.	3,600
Health, Education, and Welfare	Burn treatment, prevention and rehabilitation, epidemiology and surveillance.	2,200
Housing and Urban Development	Urban building fire safety	700
Interior	Fire weather modification	4,700
National Aeronautics and Space Administration.	Space systems fire protection	2,800
National Science Foundation	Fire behavior, materials flammability	2,200
Transportation	Aircraft inflight fire and crash fire protection, ship fire protection, railroad and hazardous materials fire safety, motor vehicle fire safety.	1,300
U.S. Postal Service	Postal facility fire protection	100
Private and Public Sector		78,600
Wood and wood product industries	Fire characteristics of products and materials	600
Paper industry		5,000
Plastics industry		40,000
Fabric and carpet industry		10,000
Gypsum industry		600
Metals industry		1,300
Cement industry		100
Fire protection industry	Fire detection and suppression equipment	14,500
City fire departments, private laboratories, etc.	Operational fire prevention and control	1,500
Insurance industry	Loss prevention	5,000

FUNDING FOR FEDERAL FIRE PROGRAMS

(FY 82 - FY 87)
(in millions of $)

	USFA	NFA	CFR	TOTAL
FY 82				
Admin. request [CARTER]	$8.497	$8.594	$5.343	$22.43
Actual appropriation	$5.308	$7.594	$4.928	$17.83
FY 83				
Admin. request	$0	$8.0	$4.991	$12.99
Actual appropriation	$4.160	$9.150	$5.976	$19.29
FY 84				
Admin. request	$4.185	$10.535	$0	$14.72
Actual appropriation	$5.198	$9.826	$5.827	$20.85
FY 85				
Admin. request	$7.713	$13.27	$0	$20.98
Actual appropriation	$9.736	$13.217	$5.827	$28.78
FY 86				
Admin. request	$7.685	$11.637	$0	$19.32
Actual appropriation	$7.696	$11.816	$5.827	$25.34
Gramm-Rudman-Hollings	$7.364	$11.308	$5.576	$24.29
FY 87				
Admin request	$0	$9.041	$0	$9.04
Actual appropriation				

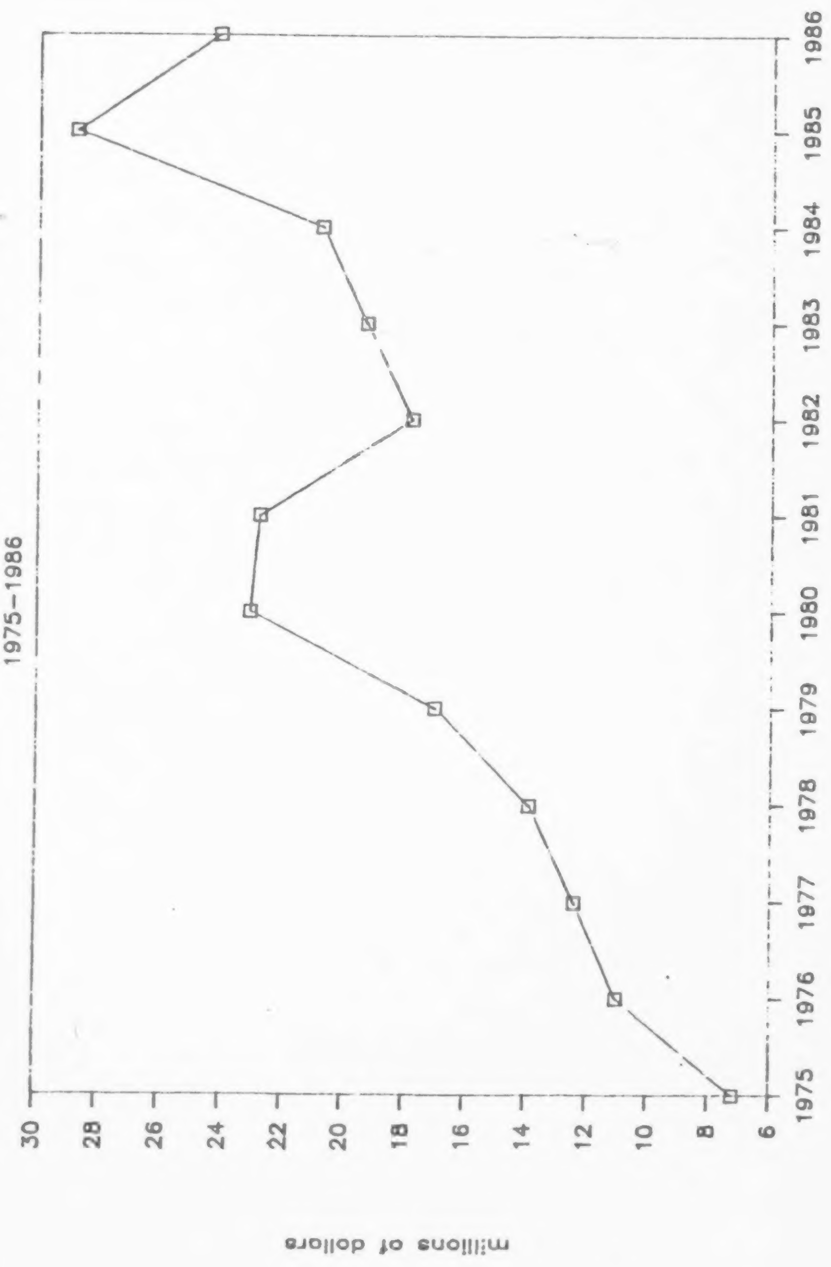
USFA -- US Fire Administration

NFA -- National Fire Academy

CFR -- Center for Fire Research

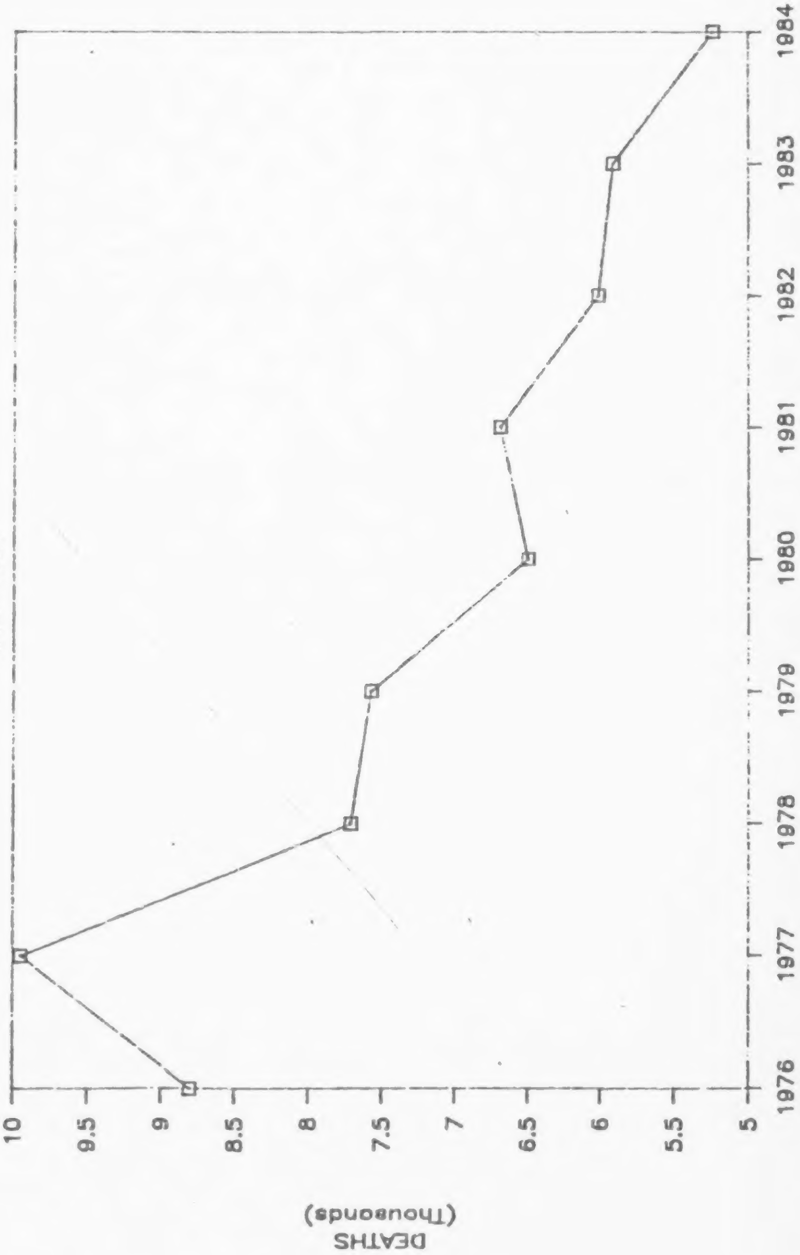
YEAR:	Total Funding: USFA, NFA, CPR (Actual approp.) (millions $) (by fiscal year)	Civilian Fire Deaths (by calendar year)
1976	$11.0	8800
1977	$12.4	9950
1978	$13.9	7710
1979	$17.0	7575
1980	$23.1	6505
1981	$22.8	6700
1982	$17.8	6020
1983	$19.3	5920
1984	$20.8	5240
1985	$28.8	not available
1986	$24.3	not available

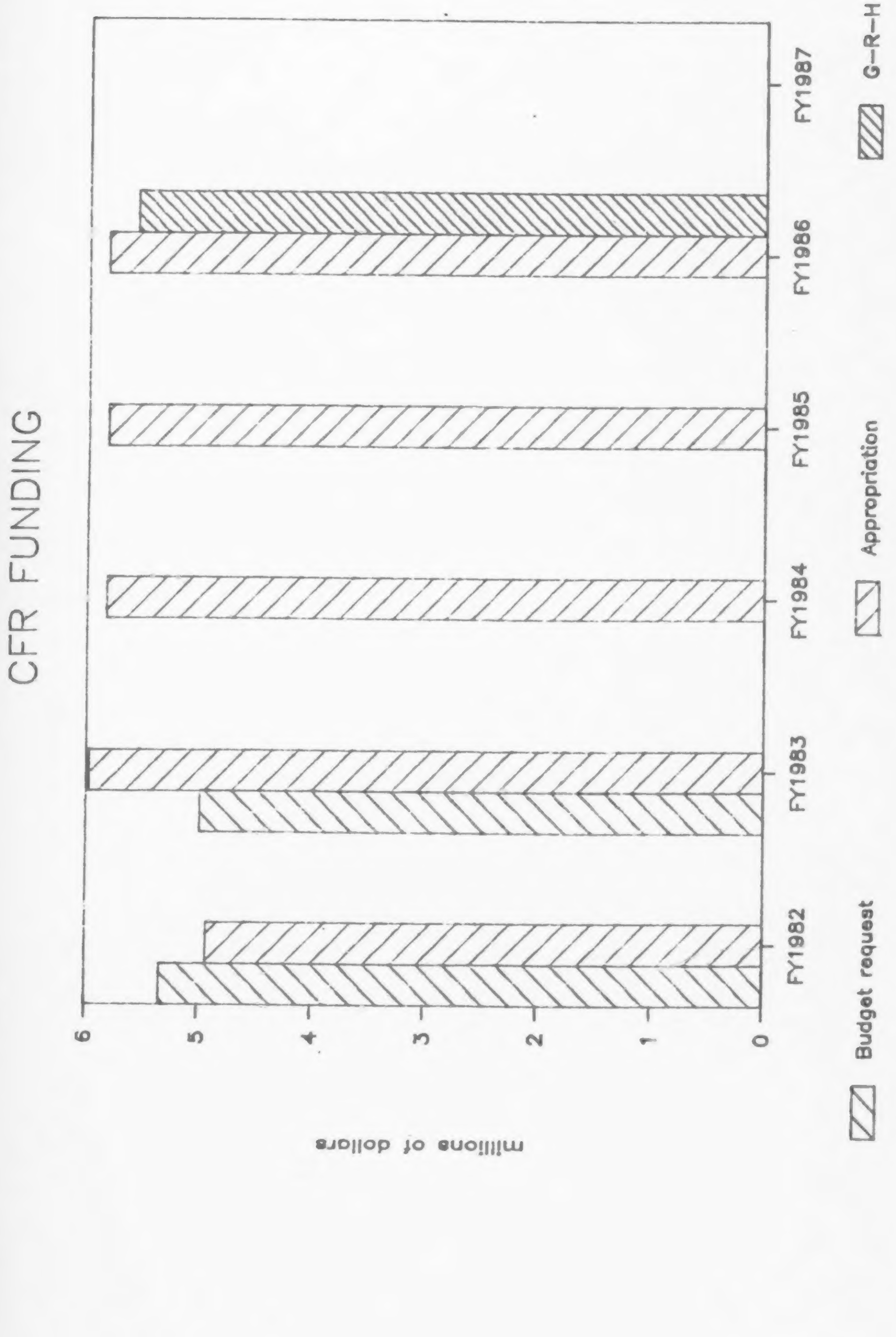
TOTAL FUNDING: USFA, NFA, and CFR
1975–1986



CIVILIAN FIRE DEATHS IN THE U.S.

1976–1984




CFR FUNDING
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FY1982
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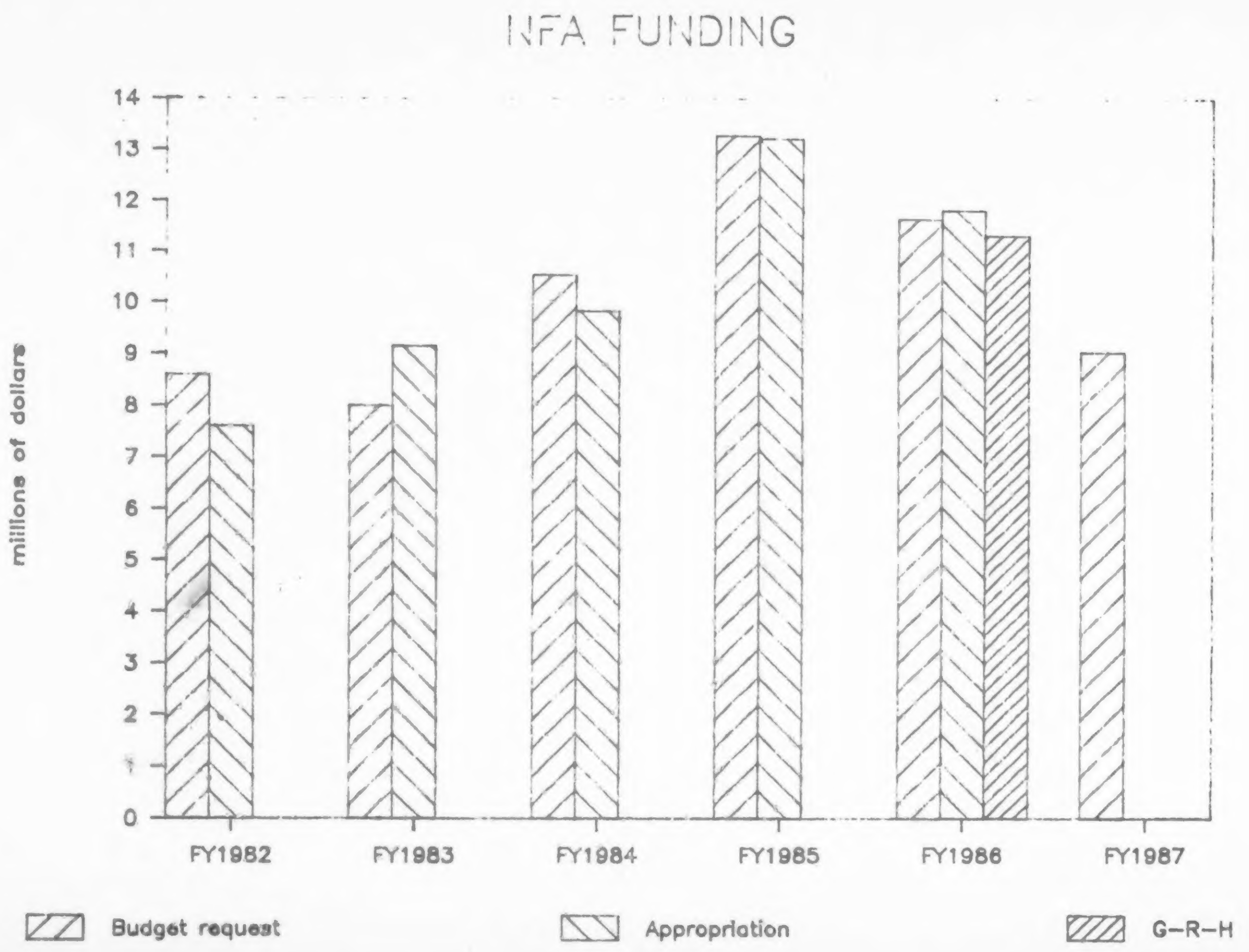
FY1985
FY1986
FY1987
Budget request
Appropriation
G–R–H


NFA FUNDING
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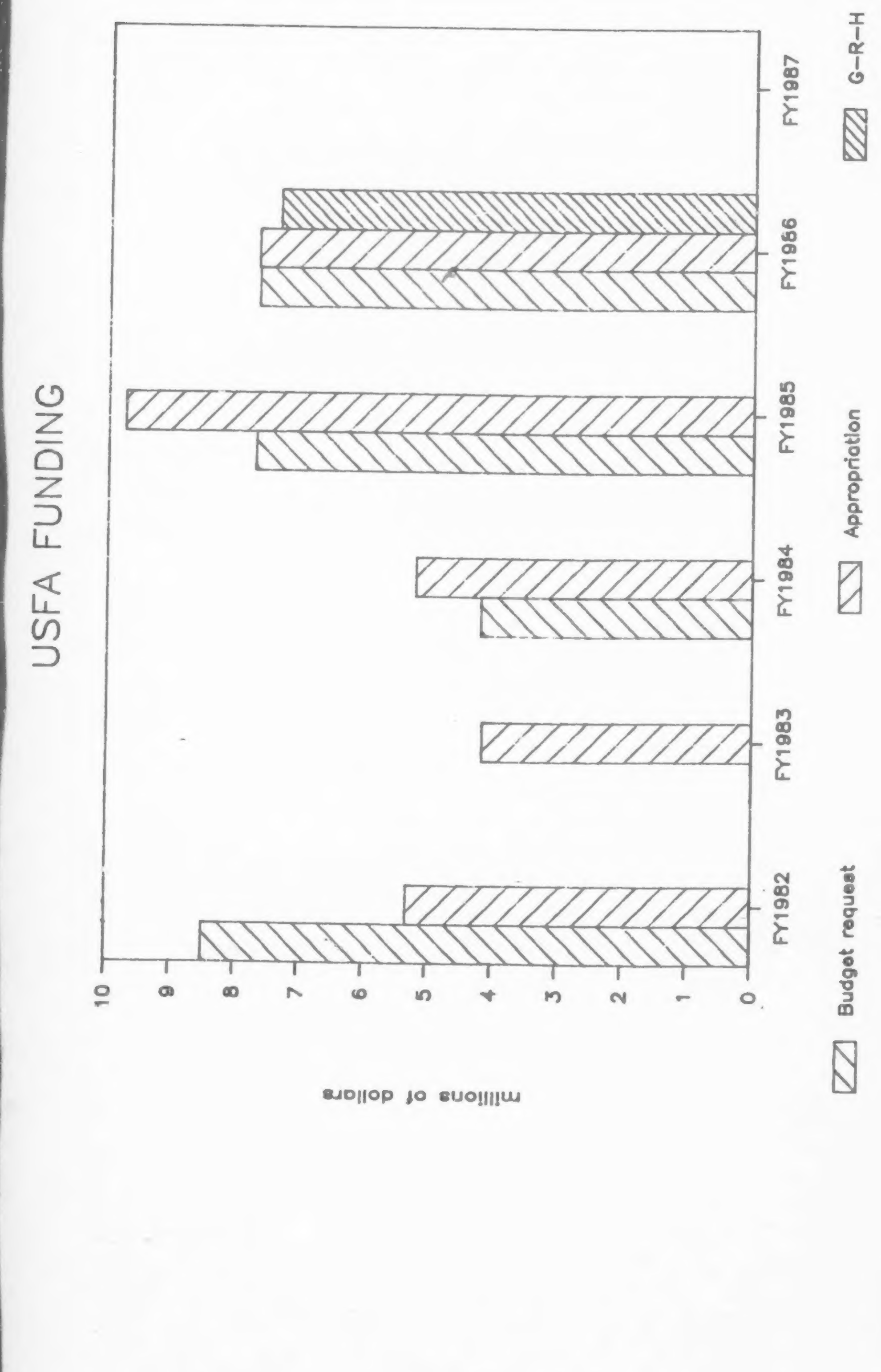
FY1987
Budget request
Appropriation
G-R-H


USFA FUNDING
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FY1982
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FY1987
Budget request
Appropriation
G–R–H

1987 NATIONAL BUREAU OF STANDARDS AUTHORIZATION

HEARINGS

BEFORE THE

SUBCOMMITTEE ON
SCIENCE, RESEARCH AND TECHNOLOGY

OF THE

COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

SECOND SESSION

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CHAPTER II. THE CENTER FOR FIRE RESEARCH*

OVERVIEW

The Center for Fire Research (CFR) was formally established in 1974 by the Federal Fire Prevention and Control Act (P.L. 93-498). The Act is explicit:

> There is hereby established within the Department of Commerce a Fire Research Center which shall have the mission of performing and supporting research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires.

P.L. 93-498 was passed in response to the frightful fire problem that was publicized by the National Fire Prevention and Control Commission in its 1973 report, America Burning. The report pointed out that the United States suffered (on a per capita basis) the worst fire death rate in the industrialized world--approximately 9,000 deaths every year. According to the National Fire Protection Association (NFPA), the toll in 1984 was 5,240 deaths. Additionally, fire was responsible for $6.7 billion in property damage. 1/

Prior to 1974, most fire research conducted in the United States was applied and short-term in nature and was oriented towards protecting property. The CFR was established to focus primarily on protecting life safety and to promote and conduct basic fire research which would contribute to the fundamental understanding of how fires start, spread, and kill. The stated goal of the CFR was (and remains) "to provide the scientific and technical basis for reducing fire losses and the costs of fire protection by 50%." 2/

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*Prepared by Lennard G. Kruger, Analyst in Science and Technology.

1/ Karter, Michael J. Fire Loss in the United States During 1984. Fire Journal, Sept. 1985. p. 14.

Budget and Organization

The CFR is one of six Centers in the National Engineering Laboratory (NEL) at NBS. It is the smallest Center in NEL, both with respect to funding (approximately 8.7 percent of NEL's total) and personnel (approximately 8.3 percent). 3/ Every year, the National Research Council's Board on Assessment of NBS Programs publishes an Evaluative Report on the National Engineering Laboratory. As part of the NEL evaluation, a special panel visits CFR annually and assesses its program.

CFR's total funding for FY1986 is $8,909,000. Of this amount, $5,827,000 (65 percent) 4/ is directly appropriated to NBS, and $3,082,000 (35 percent) is reimbursible funding from other Government agencies. The appropriation includes $2,000,000 for university grants. CFR's appropriation of $5,827,000 constitutes approximately 4.8 percent of the total NBS appropriation.

The Center is staffed by 91 full-time employees (including 60 professionals). Additionally, there are 17 part-time employees, and 30 guest

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2/ Snell, Jack. Long Range Plan—Center for Fire Research. Unpublished document. Nov. 1984.

3/ National Research Council. Board on Assessment of NBS Programs. An Evaluative Report on the National Engineering Laboratory, Fiscal Year 1985. Washington, 1985.

4/ When Gramm-Rudman sequestration goes into effect for FY1986, this amount will be reduced by 4.3% to $5,576,000.

workers and research associates. Researchers at CFR represent a wide range of disciplines, including fire protection engineering, physics, chemistry, mechanical and chemical engineering, computer sciences, toxicology, operations research, and psychology.

Programs

CFR's long-range plan presents a technical strategy that involves: promoting advances in basic fire science; developing and promoting the widespread use of scientifically based fire protection engineering practices; and providing technical support for the resolution of major fire issues and problems.

Basic fire science is performed both in-house and through a $2 million per year university grant program. Both chemical and physical processes that underlie macroscopic fire phenomena are explored. For example, highly technical areas, such as soot formation and growth kinetics and smoldering combustion propagation, are currently being studied.

Over the past 10 years, the deepening understanding of basic fire phenomena, coupled with the tremendous increase in the capabilities of microcomputer technology, have made it possible for CFR to begin developing scientifically-based computer fire models. These models can predict, within different types of buildings or enclosures, the growth and spread of fire and smoke and the resulting hazards to building occupants.

Predictive computer modelling based on the results of fundamental fire research is the central thrust of the CFR program. Computer fire models can be used to assess quantitatively the total fire hazard of a given structure. Important variables (such as building geometry; type of material burning; location and performance of smoke detectors and sprinklers; and occupant location and response) can be adjusted to simulate real-life situations. Predictive fire modeling is still in its infancy: further data, understanding of fire phenomena, and validation are needed before these models can realize their full potential.

Ultimately, CFR envisions that predictive fire models could be used to formulate scientifically based building and fire codes. Similarly, this tool could be used to help resolve some major issues in fire safety, such as whether building materials should be regulated based on the toxic gases they emit when burned. Many in the fire community like to point out that those in other fields, such as bridge building or aerospace design, already enjoy advanced computer modeling capabilities. Fire safety code-making is viewed as an art which is on the threshold of becoming a science.

CFR is composed of two laboratory units: the Fire Safety Technology Division and the Fire Measurement and Research Division. Each division consists of several distinct groups which reflect different aspects of fire research. However, none of the groups are self-contained; a project may typically involve researchers from several different groups.

The following lists each group, its function, and the number of in-house researchers working within that group:

Fire Safety and Technology Division

1. Fire Simulation Group — integrates models and necessary data into fire simulation and prediction techniques, and acts as an interface between computer based activities of CFR and interested parties in the public and private sectors (five researchers)

2. Hazard Analysis Group — analyzes fire risk by developing research models and associated computer codes to predict fire hazard development and people movement in buildings (eight researchers)

3. Compartment Fire Model Group — is developing a benchmark fire growth computer code for describing fire development in one or more rooms (four researchers)

4. Fire Growth and Extinction Group — develops models and algorithms to describe the comprehensive dynamics and elemental processes of fire growth and extinction as related to gaseous, liquid, and solid fuel combustion, and the performance of fire safety systems (nine researchers)

Fire Measurement and Research Division

1. Fire Performance and Validation Group — develops the methodology to assess the accuracy and limitations of fire models, and designs experiments to guide the evolution of fire models (six researchers)

2. Flammability and Toxicity Measurement Group — develops measurement methods and underlying principles for characterizing the combustibility of furnishings and building materials, and the impact of combustion products on living organisms (eight researchers)

3. Exploratory Fire Research — develops scientific knowledge of fundamental fire phenomena down to the molecular level; furnishes fundamental scientific information to support the other activities within CFR (thirteen researchers)

Facilities at CFR

Construction of a special fire test building was completed at CFR in 1974 at a cost of more than $1.5 million. Experimental facilities within the fire test building include: a two-story "townhouse" burn/smoke facility, a flexible burn room and room/corridor configuration, an intermediate-scale fire resistance furnace, a furniture calorimeter, a computer-based data acquisition and analysis system, and an array of special fire test apparatus. Much of the instrumentation at CFR is unique and is not available elsewhere in the United States. 5/

5/ U.S. General Accounting Office. Opportunities and Constraints for Expanding Use of Research Facilities at the National Bureau of Standards; Report to the Congress by the Comptroller General of the United States. RCED-85-55, Mar. 1, 1985. Washington, 1985. p. 45-47.

Possible Elimination of CFR

Whether or not CFR should exist has been an issue before Congress for the past three years. Starting in FY 1984, the Administration's budget requests have recommended the elimination of CFR, claiming that CFR's activities are more properly the role of state and local governments and the private sector.

More recently, the Administration has added the argument that in the interest of deficit reduction, the CFR must be sacrificed in favor of more pressing research priorities at NBS. Congress restored funding for the CFR in fiscal years 1984 through 1986. The President's FY1987 budget again recommends no funding for CFR.

ESTABLISHMENT OF THE CFR

The Center for Fire Research at the National Bureau of Standards was formally established by the Federal Fire Prevention and Control Act of 1974 (P.L. 93-498). However, the roots of fire-related research at NBS go all the way back to 1904. In that year, a huge fire in Baltimore consumed 70 city blocks despite the efforts of 1700 firefighters who had come from as far away as New York City to fight the blaze. Unfortunately, the out-of-towners could not hook up their hoses to Baltimore hydrants because there was no standardization of coupling threads. 6/ This incident dramatized the need for a hose-hydrant coupling standard and suggested

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6/ Advisory Commission on Intergovernmental Relations. The Federal Role in the Federal System: The Dynamics of Growth. The Federal Role in Local Fire Protection. Prepared by Mavis Mann Reeves, University of Maryland, Oct. 1980. Washington, 1980. p. 32.

that the newly formed National Bureau of Standards could play a role in fire prevention and control.

In 1914, Congress appropriated funds to NBS for a special study on the fire resistance of building materials. There was concern at that time that many newly built, supposedly fireproof structures were burning as easily as older buildings. NBS surveyed city building codes and found them riddled with bad information about the fire characteristics of building materials. For example, the codes did not take into account the different melting points of different materials and the ways that fire would affect their structural integrity; most codes assumed that brick, plaster, mortar, cement, and metals were equally fire-resistant. [7/]

In a joint venture with the National Fire Protection Association and Underwriters Laboratories, NBS began to study the fire safety of building materials used in all types of construction and under all kinds of fire conditions. The study furnished architects, builders, State and city building bureaus, and insurance companies with fundamental data on the fire safety of building materials. This effort was housed in a fire resistance section in the Heat Division of NBS. However, because of the broad scope of the undertaking, other NBS divisions—the chemistry, structural materials, weights and measures, and electrical divisions—became involved. [8/] In 1931, building construction standards were published which are still used in State and local building codes.

[7/] Cochrane, Rexmond C. Measures for Progress, A History of the National Bureau of Standards. Washington, U.S. Dept. of Commerce, 1966. p. 130-131.

[8/] Ibid.

In the 1920s fire research constituted a significant part of NBS activities. However, as NBS grew, the amount of fire research remained fairly constant and became a smaller part of the Bureau's work. In 1947, fire research programs were transferred from the Heat Division to the newly formed Building Technology Division. 9/

During the 1950s, the National Academy of Sciences formed the Committee on Fire Research which was to focus on the need for basic fire research. After an extensive study, the Committee recommended an expanded Federal role in performing and supporting fundamental fire research. These recommendations were favorably viewed by the Federal Council on Science and Technology, which designated the Department of Commerce as the agency responsible for coordinating and sponsoring a comprehensive fire research program. Because of the (albeit limited) amount of fire-related work NBS had been doing in its building technology program, interest in expanding NBS fire programs grew.

From 1960 to 1966, NBS received $895,000 from various defense agencies for specific fire research contracts. However, attempts to obtain increased funding from Congress for expanded fire activities proved unsuccessful. In 1963, NBS requested an additional $1.2 million for building a fire research laboratory, increasing out-of-house research contracts, and establishing regional fire centers which would help local authorities with firefighter training, firefighting equipment evaluation, information dissemination, and other fire prevention and control tasks.

9/ Reeves, The Federal Role in Local Fire Protection. p. 32.

The request died in the House Appropriations Committee in the face of opposition from the National Fire Protection Association and some insurance and fire service groups who charged that NBS was attempting to federalize the fire departments and would duplicate activities in the private sector. 10/

In the latter half of the 1960s, Congress enacted two laws which had an impact on fire research activities at NBS. The Flammable Fabrics Act of 1967 (P.L. 90-189) authorized the Secretary of Commerce to:

> (1) conduct research into the flammability of products, fabrics, and materials;
> (2) conduct feasibility studies on reduction of flammability of products, fabrics, and materials;
> (3) develop flammability test methods and testing devices; and
> (4) offer appropriate training in the use of flammability test methods and testing devices.

Under the flammable fabrics program, NBS worked with the Department of Health, Education, and Welfare (HEW) to help formulate Department of Commerce flammability standards for children's sleepwear in the early 1970s.

In 1968, the Fire Research and Safety Act (P.L. 90-259) was signed into law. In Title I, the Act amended the Organic Act of NBS to provide for:

> a national fire research and safety program including the gathering of comprehensive fire data; a comprehensive fire research program; fire safety education and training programs; and demonstrations of new approaches and improvements in fire prevention and control, and reduction of death, personal injury, and property damage.

It was the sense of the Congress that the Secretary of Commerce "should establish a fire research and safety center for administering this title."

10/ Ibid., p. 33-37.

The Act authorized $5 million for FY1969 and FY1970. Meanwhile, Title II of the Act established the National Commission on Fire Prevention and Control which was charged to study and determine effective measures which could be taken to reduce the destructive effects of fire in the United States.

Support for the Fire Research and Safety Act was widespread among fire service groups, insurance companies, and fire equipment manufacturers. The National Fire Protection Association opposed the bill because it feared Federal infringement on its data collecting and code making activities. 11/

Title I of P.L. 90-259 had provided for a comprehensive fire program at NBS which advanced well beyond the scope of fire research. However, appropriations were not forthcoming to initiate many of the programs spelled out in the legislation. Ironically, it was Title II which ultimately had a far greater impact on NBS fire research activities. In 1973, the National Commission on Fire Prevention and Control produced its landmark report, America Burning. The report urged the establishment of a United States Fire Administration (USFA) which would provide a national focus for the Nation's fire problem. America Burning supplied the impetus for successful passage of the National Fire Prevention and Control Act of 1974 (P.L. 93-498), which established the National Fire Prevention and Control Administration within the Department of Commerce (later renamed the U.S. Fire Administration and transferred to the Federal Emergency Management Agency).

11/ Ibid., p. 46.

Regarding NBS, P.L. 93-498 replaced Title I of the Fire Safety and Research Act of 1968 with a new section amending the NBS Organic Act:

> There is hereby established within the Department of Commerce a Fire Research Center which shall have the mission of performing and supporting research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires. The content and priorities of the research program shall be determined in consultation with the Administrator of the National Fire Prevention and Control Administration.

Whereas in 1968, NBS was authorized to perform a wide range of fire prevention and control activities, the 1974 Act limits its scope to research: the program was to include "basic and applied research for the purpose of arriving at an understanding of the fundamental processes underlying all aspects of fire" and "research into the biological, physiological, and psychological factors affecting human victims of fire, and the performance of individual members of fire services." The bill authorized $3.5 million for the Center for Fire Research in FY 1975, and $4.0 million for FY 1976.

During legislative consideration of the National Fire Prevention and Control Act, there was almost universal agreement that a Federal role in fire prevention and control was appropriate. This concept had already received congressional approval six years earlier with the passage of the Fire Research and Safety Act of 1968. Support was solid in the fire community (the NFPA, that had previously opposed the bill in 1968, now supported the measure). Both houses of Congress approved the bill overwhelmingly: in the Senate, the bill was passed by a vote of 62 to 7; the House passed it by a vote of 352 to 12. Minor opposition to the bill was based on the concern over limiting Federal spending.

Disagreement over the bill centered on the organizational makeup of the new agency. The Commission report, America Burning, recommended that the NFPCA be placed in the Department of Housing and Urban Development. However, the Administration wanted the Agency placed within the Department of Commerce partly because of ongoing NBS fire activities within that department. The Administration's view prevailed.

In the Senate version of the bill, all NBS activities would be transferred and located at the newly created fire agency within the Department of Commerce. The House version kept basic fire research programs at NBS, and the Conference Committee eventually adopted this aspect of the House bill.

P.L. 93-498 combined NBS programs under the Flammable Fabrics Act, the Fire Research and Safety Act, and the well established building fire research program into the new Center for Fire Research. Some program reorganization soon began. In 1975, the Fire Service Technology Program of NBS (initiated under authority of the Fire Research and Safety Act) was transferred to the NFPCA, and Flammable Fabrics Act funds were transferred to the Consumer Product Safety Commission. Also in 1975, the House Committee on Science and Technology directed that the part of the National Science Foundation's university grant program in basic fire research (within the program known as Research Applied to National Needs [RANN]) be transferred to CFR. In 1977, the NSF fire research grant program was completely transferred to CFR and funding was set at a level of approximately $2.0 million.

Attempt To Eliminate CFR

Beginning in fiscal year 1984, the Administration has repeatedly requested no funding for CFR. Congress has restored funding for fiscal years 1984, 1985, and 1986. The official rationale for CFR's proposed elimination is spelled out in the FY 1987 NBS budget request:

> Budget priorities for NBS were formulated with particular concern for areas where the Federal Government may be undertaking efforts that are more properly the role of private sector and State and local governments. Fire safety is traditionally overseen by State and local governments. In addition, industry, insurance companies, and associations have economic incentives to assure improved fire safety.

The Administration's assertion that CFR activities could be performed and funded by the private sector and State and local governments has been vigorously attacked by a broad base of organizations and groups involved in fire safety and research; they assert that CFR's activities could not be picked up elsewhere if CFR is eliminated. Table I lists the wide variety of groups that have gone on record to support CFR before the House Committee on Science and Technology and the Senate Committee on Commerce, Science and Transportation. Prominent among these groups are the industries, insurance companies, and associations which the Administration deems likely to assume CFR programs.

The Administration has argued that many of these groups are unlikely to acknowledge their ability to take over CFR activities as long as Federal money continues to flow into programs from which they benefit and would otherwise have to fund themselves. Hard evidence on whether CFR's role could or would be filled by others is not forthcoming at this point in the debate.

During the past year, the Administration has added the argument that elimination of CFR is a simple matter of NBS research priorities during times of very tight budgets. At the House Fire Act Authorization hearings on March 21, 1985, this argument was advanced by NBS Deputy Director Raymond G. Kammer, who testified that CFR's termination was necessary "to allow

TABLE I. Organizations Opposing the Elimination of CFR, 1983-1986

Insurance-Related Fire Research Laboratories

Factory Mutual Research	Underwriters Laboratories

Fire Service

Joint Council of National Fire Service Organizations
International Association of Fire Chiefs
International Association of Fire Fighters
National Volunteer Fire Council

Standards and Codes

National Fire Protection Association
American Society for Testing of Materials
National Conference of States on Building Codes and Standards

Building and Construction

American Institute of Architects
National Association of Home Builders
National Institute of Building Sciences
Asphalt Roofing Manufacturers Association
American Society of Heating, Refrigerating and Air Conditioning Engineers

Materials

American Iron and Steel Institute
Allied Tube and Conduit Corp.
Society of the Plastics Industry
Man-Made Fibers Producers Association
Carpet and Rug Institute
National Forest Products Association
Wood Heating Alliance

Other

Society of Fire Protection Engineers
U.S. Chamber of Commerce
Consumer Product Safety Commission
General Electric
Citizens Committee for Fire Protection
American Health Care Association

NBS to undertake new programs addressing critical new technologies [such as advanced ceramics or fiber optics] with greater economic potential to the United States without increasing the NBS budget." 12/

With the President's FY 1987 budget request again eliminating funding for CFR, the future of the Center remains uncertain.

FUNDING AND PROGRAMMATIC HISTORY OF CFR

Since its establishment in 1974, the CFR has undergone some significant changes, both in funding sources and in program strategy. This section will present a budget history of CFR and a brief summary of how the CFR program has evolved over the past decade. CFR activities in the areas of standards and code support, regulatory support, problem solving for other Government agencies, and information dissemination will be described. Additionally, CFR's involvement in two particularly controversial fire safety issues, combustion toxicity and fire safe cigarettes, will be briefly discussed.

Budget History of the CFR

From 1975 to 1979, the CFR received nearly all of its direct appropriations through the USFA, even though it was physically located at NBS. CFR was a part of both the USFA and the NBS, and both of those Agencies were housed in the Department of Commerce. However, in FY1980 the USFA was transferred to FEMA, and the CFR's appropriation was split between NBS and USFA.

12/ U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Hearings, 99th Cong., 1st Sess., Mar. 21, 1985. Washington, U.S. Govt. Print. Off., 1985. p. 69.

Finally in 1983, CFR's direct appropriation was supplied solely by NBS through the Department of Commerce appropriation. Table II shows a breakdown of CFR appropriations from fiscal years 1974 to 1986. For each year, "pass through" funding from USFA and funding from NBS are shown.

Table II. Direct Appropriations for CFR, 1974-1986
($ Thousands)

	NBS	USFA	Total Appropriation
1974	4,052	0	4,052
1975	1,181	2,100	3.281
1976	0	3,195	3,195
1977	0	4,578	4,578 a/
1978	0	4,664	4,664
1979	0	4,988	4,988
1980	1,214	3,894	5,108
1981	1,290	4,018	5,308
1982	1,391	3,537	4,928
1983	5,976	0	5,976 b/
1984	5,827	0	5,827
1985	5,827	0	5,827
1986	5,827	0	5,827

a/ Increase of $900,000 transfered from NSF; $389,000 programmatic increase for grants program.

b/ Increase of $350,000 for toxicity research.

Source: National Bureau of Standards.

In addition to directly appropriated funding shown in Table II, CFR also has received reimbursable funding from other Government agencies. Table III depicts total funding for CFR, including direct appropriations and other agency funding. As shown in Table III, the percentage of total funding that is derived from other agencies is significant, averaging at about 36 percent over the past 13 years.

Table III. Total Funding for CFR, 1974-1986
($ Thousands)

	Appropriation	Other Agency	Total Funding	Other Agency, % of Total Funding
1974	4,052	1,750	5,802	30%
1975	3,281	2,500	5,781	43
1976	3,195	2,542	5,737	44
1977	4,578	2,547	7,125	36
1978	4,664	2,445	7,109	34
1979	4,988	2,807	7,795	36
1980	5,108	3,107	8,215	38
1981	5,308	3,108	8,416	37
1982	4,928	2,487	7,415	34
1983	5,976	3,586	9,562	37
1984	5,827	2,727	8,554	32
1985	5,827	2,288	8,115	28
1986	5,827	3,082 a/	8,909	35
				avg. = 35.7%

a/ FY1986 estimate.

Source: National Bureau of Standards.

Programmatic History of CFR

The scope of CFR's program has shifted considerably since the Center's establishment in 1974. At that time, there was a focus on using fundamental knowledge to develop, modify, and improve standard test methods for specific items (e.g., furnishings, smoke detectors, building components, etc.). This focus was reflected by the internal structure of CFR. Its Fire Safety Engineering Division contained the following formal programs: Products, Furnishings, Construction, Fire Detection and Control Systems, and Design Concepts. 13/

CFR has never had the authority to translate its findings into regulations, standards, or codes. However, CFR was authorized to convey its findings to voluntary standards organizations or other Federal agencies which are free to base regulatory or standard-making decisions on CFR developed information. Until recently, about one-fourth of CFR's authorized budget funded standards and codes support activities. 14/ Standards support can be synonymous with regulatory support—a voluntary standard is often adopted as regulation by governmental entities. CFR's standards-facilitating role (as opposed to a standards-generating role) was prescribed by the Fire Prevention and Control Act (P.L. 93-479):

> The Secretary shall insure that the results and advances arising from the work of the research program are disseminated broadly. He shall encourage the incorporation, to the extent applicable and

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13/ U.S. Dept. of Commerce. National Bureau of Standards. Center for Fire Research. Attacking the Fire Problem: A Plan for Action. NBS Special Publication 416, May 1975. Washington, 1975.

14/ Snell, Jack E. NBS Center for Fire Research Programs and Their Implications to the NFPA. Fire Journal, July 1984. p. 70.

> practicable, of such results and advances in building codes, fire codes, and standards. The Secretary is authorized to encourage and assist in the development and adoption of uniform codes, test methods, and standards aimed at reducing fire losses and costs of fire protection.

Today, CFR's focus has shifted away from laboratory test method development and towards fundamental research in support of establishing a fire simulation and prediction capability. Reasons for this shift are both scientific and political. Advances over the past decade in fire science, computer technology, and electronic sensing equipment have made computer based predictive modeling feasible for the first time. Laboratory test methods are based on established applications and can only provide information about specific fire scenarios. Predictive models, on the other hand, are generic and not limited to one particular application or set of conditions. Furthermore, a laboratory-scale test can cost several thousands of dollars and take a week to set up, whereas a computer test, once developed, may cost $100 or less to run. 15/ Developing predictive models does not, however, preclude or replace laboratory work. On the contrary, the experimental test facilities at CFR are needed to both create and validate the computer models.

Changes in Federal R&D policy implemented by the Reagan Administration have also precipitated the programmatic shift at CFR. The Administration views most technology development, demonstration, and implementation as local and private sector responsibilities. Using this rationale, one could argue that developing specific test methods and standards for standards organizations is an activity that these organizations should pay for themselves.

15/ U.S. Dept. of Commerce. National Bureau of Standards. NBS Research Reports: NBS Fire Research is Framework for Safer Buildings. NBS Special Publication 680-3, July 1985. p. 15.

The recent shift in emphasis of the CFR programs has implications for activities related to information dissemination, standard and code support, and regulatory support. These implications as well as past achievements in these areas will be discussed. Additionally, some past examples of problem solving for other Federal agencies will be presented.

Information Dissemination

CFR's information dissemination capability is largely a by-product of its interaction with a variety of public and private sector groups. Through participation in consensus standards-writing and building code organizations, grants to universities, project work for other Government agencies, collaborative agreements with private sector research laboratories, and cooperative programs for visiting research associates and guest workers, CFR has established many links to the fire community.

Throughout its existence, a portion of CFR's budget has funded more formal mechanisms for information dissemination and technology transfer: conferences, symposia, workshops, publications, and a CFR Information Service. However, since CFR has directed its limited funding towards basic research and predictive computer modeling, there is little left to finance information dissemination activities. 16/ Nevertheless, technology transfer remains as important as ever, because predictive fire models will not reduce fire loss unless they are accepted and used by the fire community. Consequently, CFR is seeking voluntary private sector participation in

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16/ Snell, NBS Center for Fire Research Programs and Their Implications to the NFPA, p. 72.

disseminating its work. External organizations can serve as intermediaries to channel CFR research results towards code-making, public education, or other fire safety related activities. For example, the Society of Fire Protection Engineers (SFPE) is now distributing fire model software developed at CFR and is conducting seminars on the use of these models. Similarly, the American Society of Heating, Refrigerating and Air Conditioning Engineers has published a Smoke Control Handbook based on CFR computer fire models. 17/

To help foster private sector interest and participation in the advent of predictive fire modeling, CFR, USFA, and the NFPA began sponsoring a National Fire Research Strategy Conference in August 1984 (the second Conference was held in July 1985). The Conference provides a focal point for the disparate elements in the fire community and seeks to formulate a coordinated national strategy for fire research. Participants include: the fire service; engineers and architects; researchers in the Federal Government, academia and private industry; state and local officials; manufacturers; and many others. 18/

As part of its efforts to disseminate computer fire models to end-users, CFR has established a Fire Simulation Laboratory within its Fire Technology Division. The laboratory teaches individuals from the public and private sector how to use and adopt fire and smoke models for a variety of applications. CFR's recently developed fire and smoke

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17/ U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Prevention of Residential Fire Fatalities. Hearings, 99th Cong., 1st. Sess., Oct. 9, 1985. Washington, U.S. Govt. Print. Off., 1986. p. 28.

18/ U.S. Dept. of Commerce. National Bureau of Standards. Center for Fire Research. National Fire Research Strategy Conference Proceedings. NBSIR 85-3290, Dec. 1985. Washington, 1985.

transport (FAST) model has already been widely distributed to fire safety professionals.

Standards and Codes Support

CFR staff members have participated in many voluntary consensus standards writing committees and fire code organizations, including the NFPA, the American Society for Testing and Materials (ASTM), the American Society of Mechanical Engineers (ASME), and the American National Standards Institute (ANSI). The shift in CFR priorities means that the level of technical support for the laboratory testing which is provided to standards committees will be reduced. According to the NFPA, standards committees will be forced to rely more on the private sector for new test methods. These tests will then have to be "run through" various standards organization committees to insure that the industry-generated test methods are free of bias. Though workable, the process could take longer than using CFR test methods, which are perceived to be already free of industry bias. Although the shift in CFR activities will complicate standards-making in the short term, NFPA points out that the development of predictive fire models will ultimately be a much more powerful and versatile tool for formulating standards. 19/

One of the major impacts that CFR has had on codes and standards in the past stems from development of the Fire Safety Evaluation System (FSES). Traditionally, building designers are required to adhere rigidly

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19/ Arthur E. Cote, Assistant Vice President--Standards, National Fire Protection Association. Personal communication, Jan. 31, 1986.

to applicable building and fire codes. The FSES assigns points for different fire safety features of a building, thereby allowing designers the flexibility to choose cost effective alternate routes towards achieving an equivalent level of fire safety. By making tradeoffs—such as substituting sprinklers for heavy doors—significant reductions in fire protection costs can be made.

The FSES has been incorporated into the NFPA's Life Safety Code for health care facilities; board and care homes for the disabled and mentally retarded; detention and correctional occupancies; and other types of facilities. It is hoped by the standards community that computer fire models will eventually be used to help develop these systems.

Test methods developed at CFR are often submitted to ASTM for possible adoption. Examples include: the use of a cone calorimeter to measure heat release rates, and a test method for evaluating the acute inhalation toxicity of combustion products. 20/

Regulatory Support

Despite the fact that CFR has no regulatory authority, test methods developed at the Center can be adopted by other agencies that do promulgate regulations. CPSC flammability regulations for carpets, rugs, children's sleepwear, and mattresses specify flammability tests that CFR developed during the 1970s pursuant to the Flammable Fabrics Act.

CFR "products" have also found their way into Government regulations through a more indirect route. As previously discussed, the CFR-developed

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20/ NBS Research Reports, July 1985. p. 17.

Fire Safety Evaluation System has been extensively adopted by the NFPA's Life Safety Code. In and of itself, the Life Safety Code does not have the force of regulation. However, it is often adopted as regulation by States, localities, or Federal agencies. For example, the Health Care Finance Administration at HHS requires that hospitals and nursing homes meet Life Safety Code standards (which include the FSES) in order to qualify for medicare and medicaid certification.

In the current deregulation climate of the Administration, CFR's work is also used to support alternatives to regulation (such as CPSC's voluntary flammability standard for the furniture industry) and to determine whether regulatory action may ultimately be necessary. An example is CFR's participation on the Technical Study Group on Cigarette and Little Cigar Fire Safety. The Cigarette Safety Act of 1984 (P.L. 98-567) established the Study Group and directs CFR and other Government and private groups to "determine the technical and commercial feasibility, economic impact, and other consequences of developing cigarettes and little cigars that will have a minimum propensity to ignite upholstered furniture or mattresses." Whether or not a "fire safe" cigarette is feasible, and whether cigarettes should be mandated to meet certain standards of self extinguishment has been a highly controversial issue in Congress for many years. In support of the Study Group, CFR recently received $150,000 from the CPSC to test ignition characteristics of different cigarettes.

An equally controversial fire safety issue that involves CFR is smoke toxicity. Some States and localities are considering regulatory measures which could ban, limit, or restrict the use of particular building materials based on the toxic products they emit when burning. New York State, for example, is considering regulations that would require toxicity testing and data filing of materials as a prerequisite for their use in buildings.

Some in the fire community (such as metals industries and the firefighters union) assert that burning plastics and synthetic materials constitute an excessive hazard to life safety. The plastics industry vehemently opposes this view, arguing that all burning materials emit poisonous carbon monoxide and that a realistic appraisal of a material's fire hazards must address many other factors and properties in addition to toxicity.

CFR conducts basic research in combustion product toxicity. Researchers at CFR feel that predictive models based on this research could assess the life safety hazards of various materials, and would provide Government officials with an objective scientific base on which to make regulatory decisions. As a first step toward resolving this very sensitive issue, CFR has recently proposed to work with the USFA and NFPA to promote a nationally accepted smoke toxicity screening test which could identify "those materials or products which have smoke toxicities sufficiently beyond the range of commonly accepted products to warrant special, further study of their smoke toxicity hazard potential and possible restriction of use." 21/ A national fire and smoke toxicity hazard database is also proposed.

21/ Proposed National Response to Public Concerns about Smoke Toxicity. Coordinated by United States Fire Administration, Center for Fire Research, and National Fire Protection Association. Unpublished document.

Problem Solving for Other Agencies

As mentioned earlier in this section, about 35% of CFR's funding comes from other Federal agencies. Agencies that have sponsored CFR work include the Department of Health and Human Services, Federal Aviation Administration, Navy, Coast Guard, Defense Nuclear Agency, Consumer Product Safety Commission, U.S. Geological Survey, Veterans Administration, U.S. Park Service, and many others. Examples of agency sponsored projects are:

— work done for the U.S. Park Service which developed a computer based fire test simulation for a typical National Park tourist accomodation;

— a Coast Guard sponsored study which analyzed the degree of fire hazard in the hold of large ships used to transport flammable liquids and gases;

— a series of tests conducted for the Veterans' Administration which evaluated smoke movement in hospital type facilities; and

— a project for the Defense Nuclear Agency which addresses the "nuclear winter" issue (climatic effects of fires which could result from nuclear war) through research into smoke production from large fires.

Obviously, much of the agency commissioned work that CFR performs is very closely tied to the mission of the sponsoring agency. Given that a significant amount of CFR's funding is supplied by other agencies, it must be recognized that much of this work, though potentially worthwhile and useful to the funding agency, does not necessarily have a direct effect on reducing residential fires, which are the leading cause of fire deaths. However, other agency projects may provide an opportunity to develop or test approaches that subsequently may have a more general application.

FIRE RESEARCH ACTIVITIES OUTSIDE OF CFR

This section will briefly outline fire research capabilities outside of CFR and the extent to which some of these groups could absorb CFR programs. Fire research capabilities in the private sector, standards organizations, universities, states and localities, and other Federal agencies will be discussed.

Private Sector Fire Research

Private sector fire research generally tends to be applied, short-term, and oriented toward protecting property and responding to immediate commercial needs. The three companies most cited in any discussion of private sector fire research are Factory Mutual Research Corporation, Southwest Research Institute, and Underwriters Laboratories. All three house a significant fire research and testing capability and all offer fire testing and research services to interested clients. Of course many other individual companies conduct different forms of fire research. Their projects are directly oriented toward the mission and goals of that particular firm.

Factory Mutual Research Corporation (FMRC), with headquarters in Norwood, Massachusetts, is the Nation's largest private sector performer of fire research. A group of mutual insurance companies that comprise the Factory Mutual System established FMRC to provide services for the benefit of Factory Mutual insurance policyholders. FMRC also performs research, under contract, for industrial and Government clients.

FMRC has extensive experimental facilities, including a test center in West Glocester, Rhode Island, where full-scale fire and explosion tests are performed. The internal research budget is approximately $3,000,000. Of this amount, about 80 percent is aimed primarily at improved protection of industrial and commercial properties. The remaining 20 percent funds long-term or basic research which could be ultimately relevant to either protecting property or reducing life loss. 22/

CFR and the USFA have funded both basic and applied research at FMRC which is closely linked to life safety concerns. Under a USFA contract, FMRC developed an affordable residential sprinkler system for the home.

With CFR grants, FMRC's basic research group has worked on fire modeling. Interaction between CFR and FMRC is strong; in fact, FMRC's Basic Research Department started its work at NBS in 1965, and moved to Massachusetts in 1968. According to FMRC Vice President and Chief Operating Officer Paul Fitzgerald, "Without the Center, our own program would be seriously impaired. Certainly, no single organization has the resources to duplicate the Center's and the loss of those resources would greatly diminish the output of all U.S. fire researchers." 23/

Aside from Factory Mutual, Southwest Research Institute (SWRI) and Underwriters Laboratories (UL) are other private institutions with a

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22/ Letter from Paul M. Fitzgerald, Chief Operating Officer, Factory Mutual Research Corporation. In: U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. 1986 National Bureau of Standards Authorization. Hearings, 99th Cong., 1st Sess., Mar. 6, 1985. Washington, U.S. Govt. Print. Off., 1985. p. 487.

23/ Ibid., p. 488.

significant fire research or testing capability. The Southwest Research Institute's Department of Fire Technology (San Antonio, Texas) is staffed by 31 people who conduct experimental work for commercial and government clients. About 90 percent of the department's work is concerned with solving specific problems for commercial clients, who range from small entrepreneurs to large corporations. 24/ Additionally, the Institute performs toxicity research, under contract, for CFR and the Federal Aviation Administration (FAA).

SWRI employs a "build and burn" approach; that is, it is hired by a client to run a large-scale fire test for a certain product or structure that is specified by that client. Although SWRI is currently exploring ways to use computer fire models, it cannot conduct the basic research necessary to develop these models. According to an SWRI official, while the elimination of CFR would seriously hinder the development of computer fire models, it would not significantly damage SWRI's business, because they could continue to sell their experimental services to industry. 25/ Thus it appears that SWRI would have no incentive to absorb the basic research activities of CFR.

Underwriters Laboratories Inc. (Northbrook, Illinois) is strictly a testing laboratory which is claimed to conduct more fire testing than any other organization in the United States. 26/ As an independent third-party laboratory, UL provides testing, evaluation, inspection, and

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24/ Jess Beitel, Southwest Research Institute. Personal communication, Feb. 12, 1986.

25/ Ibid.

26/ Letter from Jack Bono, President, Underwriters Laboratories Inc. In: 1986 NBS Authorizations, House Committee on Science and Technology. p. 575.

marking services for a variety of products, equipment, and materials. UL utilizes established laboratory test methods, many of which were developed with the cooperation and support of CFR. Currently, UL is beginning to use computer fire models in conjunction with its historical testing services.

Like FMRC and SWRI, UL takes the position that it would be unable to absorb CFR's role in basic research. According to Jack Bono, President of UL, "Our work, like much of that in the private sector, is oriented to specific products and consists of practical but narrowly oriented efforts. We look to the Center for Fire Research for leadership in developing the scientific and theoretical information on which practical implementation of engineering knowledge can be based." 27/

Fire research in the private sector presents some important differences from the work done at CFR. Private sector research is more applied, more oriented towards protecting commercial property, and more susceptible to conflicts of interest since it is funded by private companies that have a stake in the results. Some basic research principally oriented towards protecting life safety has been performed in the private sector, but this work is generally funded by Government agencies (often by CFR).

Standards Organizations

Approximately 30 voluntary standards organizations in the United States are concerned with some aspect of fire safety. 28/ Some, such

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27/ Ibid.

28/ National Fire Protection Association. The 1984 Fire Almanac. Quincy, Massachusetts, NFPA, 1983. p. 567-577.

as the American Society of Heating, Refrigerating and Air Conditioning Engineers or the Compressed Gas Association, are concerned with fire safety only to the extent that it may affect their overall mission. Others, such as the National Fire Sprinkler Association or the Fire Equipment Manufacturers Association, focus on a specific aspect of fire safety.

Only the National Fire Protection Association (NFPA) appears to focus solely and comprehensively on fire safety. The NFPA characterizes itself as a "technical and educational membership organization" which has developed over 200 consensus codes and standards related to fire protection.

Standards-making organizations such as NFPA or ASTM convene committees of experts who formulate fire codes by consensus. Traditionally, these committees have depended on CFR and on private labs for technical information on which to base code-making decisions. Standards organizations do not have any inhouse research capability that is even remotely similar to CFR; their role is to translate information developed elsewhere into practice.

NFPA does operate a small research foundation, which receives money from industry and channels it into areas of interest to those industries. However, this research is, of necessity, applied and oriented towards satisfying the specific needs of the industry sponsors. 29/

Universities

Fundamental long-term fire research is conducted at approximately 25 universities throughout the United States. However, nearly all of this

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29/ Arthur Cote, NFPA. Personal communication, Jan. 31, 1986.

research is funded and coordinated through CFR's $2,000,000 grant program. Table IV lists universities currently funded by CFR.

TABLE IV. University Recipients of CFR Research Grants

U. of Virginia
U. of Maryland
Rutgers U.
U. of Michigan
Case-Western Reserve
Penn State
Cal Tech
U. of California
Louisiana State
Michigan State
Brown U.
Johns Hopkins
U. of Dayton
U. of Mississippi
U. of Pittsburgh
Clemson U.
Princeton U.
Marquette U.
U. of Montana

The expertise required to develop predictive fire models does reside within the universities. For many years, in fact, the theoretical aspects of fire modeling have been studied by university researchers (who were mostly funded by CFR). However, universities do not have large-scale experimental facilities such as those at CFR or Factory Mutual, which are necessary to support a comprehensive modeling effort. Also, no single university has the kind of broad-based, interdisciplinary, centrally focused program that CFR has established.

For the most part, university fire research can be characterized as a scattering of individuals or small groups, each specializing in a very specific area of fire science. An exception is Worcester Polytechnical Institute (WPI) which has established a Center for Firesafety Studies. The program at WPI tends to occupy a middle ground between the basic research done at CFR and the product-specific work done in the private sector. For example, WPI will take a model developed at CFR, and make it more "user-friendly" by adapting it to immediate, real-world industrial needs. An important part of this process is training graduate students (future fire protection engineers) to use computer-based fire models. Like other universities, WPI has no large scale experimental facilities for fire research. 30/

If CFR were eliminated, it is difficult for many observers to foresee where universities would get the support necessary to conduct fundamental fire research, and to train young fire scientists and engineers. It is felt that the private sector will not fund long-term generic research.

Some have suggested that perhaps NSF could provide seed money for a fire center at a university. In fact, WPI's Center for Firesafety Studies was a candidate for NSF's 1986 Engineering Research Center program. Under this program, NSF would provide WPI with $5 million over a four to five year period. Ironically, WPI's bid was rejected, because of NSF's policy of funding research that is strongly linked to enhancing the industrial competitiveness of the United States. 31/

Even if funding were available for university fire research, critics assert that it would be difficult to establish a fire research capability similar to that at CFR. A grant program that stands alone might be uncoordinated and unfocused on national needs. By contrast, because CFR funds current university research projects, it can integrate this work into its in-house program objectives.

30/ Richard Custer, Associate Director, Center for Firesafety Studies. Personal communication, Feb. 3, 1986.

31/ Ibid.

On the other hand, establishing a centralized fire center at a university could also present problems. Fire research is inherently interdisciplinary, whereas universities tend to favor research within a subject-specific, disciplinary framework. It may be difficult for a university to assemble a high-caliber group of scientists and engineers with the diversity of backgrounds and expertise that would be necessary to sustain a significant national fire research effort. Observers speculate that such a center could possibly nucleate, but it would take much time and expense to recreate something that already exists.

State and Local Governments

While States and local governments have always implemented and enforced fire codes, they have never maintained any significant fire research capability. In 1984 and 1985, the National Conference of States on Building Codes and Standards (NCSBCS), which is an executive branch organization of the National Governers Association, surveyed State governments on their capability to fund fire research. Out of the 35 States that responded, only two (New York State and Texas) reported that they had ever funded any kind of fire research. Based on the survey, NCSBCS concluded "that the states individually or working together cannot and will not be able to build, staff and fund or contract such research." 32/

NCSBCS adds that even if the States were able to launch their own fire research programs, "we would have a chaotic and unproductive research

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32/ 1986 NBS Authorization, House Committee on Science and Technology p. 247.

system in which each state that could find resources for testing and research, quite probably, would duplicate research being done in another state or states. This would clearly be a waste of taxpayers' dollars." 33/

On the other hand, the Administration argues that as long as Federal programs are in place, there is no incentive for the States either to initiate research programs or to indicate any willingness or capability to do so.

Other Federal Agencies

Other Federal agencies perform or fund fire research. However, these activities are not directly geared towards reducing residential fire deaths and injuries; rather, they are closely related to the specific mission of the agency.

An agency that does have the mission of reducing residential fire loss is the Consumer Product Safety Commission (CPSC). The CPSC, which has funded much CFR research, has been active in a number of fire safety issues including smoke detectors, heating appliance fires, and toxicity of burning materials. The Commission has a limited ability to do applied research on heating appliance fires and uses a CFR-developed protocol to test different materials for fire toxicity. However, CPSC does not have the capability, facilities, or expertise to upgrade or modify this protocol. 34/

33/ Ibid., p. 241.

34/ James Hoebel, Program Manager, Consumer Product Safety Commission. Personal communication, Jan. 31, 1986.

GOVERNMENTAL FUNCTIONS OF THE CFR

As discussed earlier in this chapter, both the National Academy of Science's Committee on Fire Research and the National Commission on Fire Prevention and Control have urged maintaining a Federal role in fire research. Historically, Congress has affirmed this view, passing the Flammable Fabrics Act in 1967, the Fire Safety and Research Act in 1968, and the Federal Fire Prevention and Control Act in 1974. However, in light of the Administration's continuing attempts to eliminate the Center, it may be approriate to reexamine the question: Is fire research, and specifically the CFR program, an appropriate activity for Federal involvement?

On a functional level, this chapter has discussed CFR's activities in several uniquely governmental pursuits such as regulatory and standards support, basic research, information dissemination, and problem solving for other Government agencies.

On a more philosophical level, one can address this question on three fronts. First, is the nature or mode of research at CFR consistent with the Administration's definition of appropriate Federal R&D? Second, are the ultimate goals of CFR appropriate for a federally funded program? And finally, is CFR uniquely qualified or positioned to contribute to fire loss reduction in ways that cannot be duplicated by any other group?

Is the Nature of Research at CFR Appropriate?

Obviously, opinions vary on what types of R&D deserve Federal support. However, it may be most relevant to rely on the Administration's own definition of appropriate Federal R&D when contemplating the legitimacy of a current Federal research program such as that at CFR. The Administration sees a Federal role in supporting long-term research which is fundamental and generic, that is, potentially relevant to a wide range of applications and far removed from normal market renumeration. The Administration also favors R&D which is needed to support essential governmental responsibilities, such as national defense.

Supporters of CFR point out that the Center's research efforts are undeniably fundamental and long-term. In fact, one could argue that the recent shift of CFR away from specific test method development and towards predictive fire modeling further aligns CFR's program with the Administration's R&D philosophy. Predictive modeling is certainly generic in nature; it is not tied to any one particular application, industry, or fire scenario. Additionally, CFR constitutes a central fire research resource that is heavily used by other Government agencies, both civilian and defense.

Are CFR's Goals Appropriate for Federal Involvement?

Congress established CFR to combat the loss of life that was publicized by America Burning. This view of government as protector of the public safety was nurtured by the consumerism of the 60s and 70s. Contributing to this view was the knowledge that those hit hardest by fire—the elderly, the very young, the poor—were least able to attract private assistance in creating a more fire-safe environment.

The consumerism of years past has waned in the 80s. The Administration now favors research that is oriented toward stimulating the competitiveness of domestic industry and the economic health of the nation. Consequently, the Administration argues that the fire program at NBS must be jettisoned in favor of areas such as advanced ceramics and fiber optics which have greater bearing on future industrial competitiveness.

It must be pointed out, however, that CFR activities do contribute to the reduction of fire protection costs, thereby providing economic benefits to certain industries (e.g., building, materials, and insurance industries) as well as to the public. The Administration has acknowledged this and argues that perhaps some of these affected industries could fund work that benefits them.

Interestingly, CFR is caught in a peculiar Catch-22 situation. To the extent that CFR's primary goal is improving public safety, the Administration argues that NBS must opt for higher research priorities related to industrial competitiveness and the economic health of the United States. But, to the extent that CFR does provide economic benefits to certain industries, the Administration argues that these industries should shoulder funding responsibilities. Compounding the dilemma is the fact that industry typically shuns the type of fundamental, long-term fire research that the Administration asserts is appropriate for Federal involvement and which CFR performs and supports.

Is CFR Uniquely Qualified?

Whether or not the CFR program is an appropriately "Federal" activity might be irrelevant if some outside group could obviously assume CFR's responsibilities. Among the diverse interests and organizations that compose the fire community, none have expressed a willingness or admitted a capability to assume a significant part of the CFR programs.

For example, the private sector is primarily interested in protecting property and will fund only very applied, short-term projects which are closely tied to their commercial interests. Universities are interested in performing long-term basic fire research, but they rely on Federal funding (mostly from CFR) to support this research. And standards organizations, while contributing to life safety in buildings and consumer products, lack the facilities and resources to perform fundamental fire research.

Finally, even if private sector funding of CFR-type fire research were forthcoming, its value would be questionable because charges could be made that the funder has unduly influenced the research results. Resolving fire safety issues may involve decisions which could benefit one industry at the expense of another. A good example is the combustion toxicity issue. Currently the plastics industry is engaged in a fierce battle with the metals industry and the fire fighters union over whether synthetic building materials should be regulated based on the toxic products they emit during combustion. Clearly, research funded by either side, even if it were conducted objectively and fairly, could be perceived unfavorably. This perception could ultimately hinder its usefulness to policymakers when making regulatory decisions.

Accordingly, many in the fire community cite the value of having a Federal agency that can sit above the fray of special interests and competing industries and can provide objective and authoritative scientific and technical information that is respected by all parties.

The Administration has not presented to Congress any evidence that outside groups would satisfactorily adopt the CFR mission. 35/ However, the Administration argues that it is unrealistic to expect these groups to indicate any possibility of assuming CFR functions as long as they continue to benefit from Federal dollars. One might speculate that the only way to resolve the issue of whether outside groups could perform and support CFR tasks is to eliminate CFR and force the fire community to seek alternate mechanisms of support. Whether or not such an "experiment" is worth conducting will ultimately be decided by Congress.

Eliminating CFR would help reduce the Federal deficit and could "free up" additional funding for other NBS activities that are more related to industrial competitiveness. But, on the other hand, the prospect of others absorbing CFR programs seems to many observers both unlikely and undesirable. If CFR is eliminated and support for basic fire research fails to materialize, advances in fire safety technology could be hampered. Also, if at some point in the future a decision were made to reestablish a national fire research center, it could take many years to reassemble the capability that CFR currently offers.

35/ U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. Subcommittee on Science, Technology, and Space. National Bureau of Standards Authorization. Hearings, 99th Cong., 1st Sess., Mar. 26, 1985. Washington, U.S. Govt. Print. Off., 1985. p. 8, 23.

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FIRE PREVENTION AND CONTROL: THE FEDERAL ROLE

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FIRE PREVENTION AND CONTROL: THE FEDERAL ROLE

INTRODUCTION

The Nation's fire problem is most strikingly exposed through one statistic--according to estimates provided by the National Fire Protection Association (NFPA), 6026 people were killed by fires in 1983. Of these fire deaths, 106 were firefighters. Other statistics help round out a description of America's fire experience: in 1983, the number of fires reported was 2,326,500; civilian (i.e. non-firefighter) injuries stood at 31,275; and property loss was estimated at almost $6.6 billion. 1/

This record can be improved. The United States Fire Administration (USFA) reports that the U.S. has the second highest death rate per capita (after Canada) of all the world's industrialized nations. 2/ A city-by-city comparison can be especially revealing. For example, Hong Kong, a tightly packed, densely populated city of 5.3 million, averages 40 fire deaths a year. Meanwhile, Chicago, with a population of 3 million has suffered at least 120 fire deaths per year in recent years. 3/

1/ Karter, Michael J. and Joan L. Gancarski. Fire Loss in the United States During 1983. Fire Journal, Sept. 1984. p. 49.

2/ Federal Emergency Management Agency. U.S. Fire Administration (USFA). Fire in the United States (Second Edition). July 1982. Washington, 1982. p. 21.

3/ Schaenman, Philip S. and Edward F. Seits. From Tokyo to Down Under: International Approaches to Fire Prevention. Fire Chief, Dec. 1984. p. 27.

Fire prevention and control is traditionally a State and local responsibility. But statistics such as those cited above have motivated Federal involvement in the fire problem during the past 20 years.

In 1968 Congress passed the Fire Research and Safety Act of 1968 (P.L. 90-259), which: (1) established what is now called the Center for Fire Research at the National Bureau of Standards (NBS); and (2) established the National Commission on Fire Prevention and Control. The Act charged the Commission with undertaking "a thorough study and investigation of [the fire] problem with a view to the formulation of recommendations whereby the Nation can reduce the destruction of life and property caused by fire in its cities, suburbs, communities, and elsewhere."

In 1973 the Commission issued a report called America Burning, which recommended that "there should be an entity in the Federal Government where the Nation's fire problem is viewed in its entirety, and which encourages attention to aspects of the problem that have been neglected." [4]

While calling for a Federal role in fire protection, the Commission made it clear that such a role should be limited to "lending technical and educational assistance to State and local governments, collecting and analyzing fire information, regulating the flammability of materials, conducting research and development in certain areas, and providing financial assistance when adequate fire protection lies beyond a community's means." [5]

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[4] National Commission on Fire Prevention and Control. America Burning. May, 1973. Washington, 1973. p. X.

[5] Ibid.

In response to America Burning, Congress passed the Federal Fire Prevention and Control Act of 1974 (P.L. 93-498) which established the USFA and the National Fire Academy (NFA). In keeping with the theme of coordination set by the Commission, the Act stated: "The unacceptably high rates of death, injury, and property loss can be reduced if the Federal Government establishes a coordinated program to support and reinforce the fire prevention and control activities of State and local governments."

The Act established the National Fire Prevention and Control Administration (the NFPCA was later renamed the USFA) in the Department of Commerce. The NFPCA initially consisted of five divisions: the National Academy for Fire Prevention and Control, the National Public Education Office, the National Fire Data Center, the National Fire Safety and Research Office, and general administration. When the NFPCA began operation, fire deaths were estimated at 9,000 per year.

During fiscal year 1975 the budget of the Center for Fire Research (CFR) was consolidated with that of the NFPCA in order to foster a close coordination with the NFPCA. 6/

Since 1975 the Federal fire program has undergone many changes. These include the following:

1979--USFA is reorganized into the Federal Emergency Management Agency (FEMA);
1981--USFA and NFA budgets are separated;

6/ International Society of Fire Service Instructors (ISFSI). Evaluation of Programs of the United States Fire Administration 1974-1983. Prepared for the USFA, Federal Emergency Management Agency. 1983. p. 51.

1982--USFA is targeted for elimination and most of its staff departs. Under pressure from Congress, a last minute decision is made to continue the USFA with reduced funding. The USFA is transferred to the National Emergency Training Center in Emmitsburg, Maryland;

1983--USFA is totally restaffed with 20 employees, primarily with fire service backgrounds; and

1983--The Center for Fire Research budget is completely separated from the USFA budget.

In 1981, USFA's budget was $13.5 million. The Administration is requesting $7.68 million for fiscal year 1986. Currently the USFA consists of four offices: Fire Policy and Coordination, Firefighter Health and Safety, Fire Prevention and Arson Control, and Fire Data and Analysis. A description of USFA programs is provided in the appendix. Fire deaths today stand at nearly 6,000 per year.

The Federal Fire Prevention and Control Act assigns to the USFA the task of defining and fashioning a coordinated fire program on the Federal level. The challenge for Federal fire policymakers comes with determining the specific approaches and strategies which can most effectively reduce the Nation's fire loss, given budget limitations and the prescribed Federal role as a supporter and reinforcer of state and local fire prevention and control efforts. This involves not only selecting fire loss reducing approaches that work best, but also choosing the most cost effective means for implementing these approaches.

This report is divided into two parts. The first part presents the multiplicity of approaches and strategies which are often cited as being necessary for reducing the toll of destructive fire. The second presents fire community views on the extent that Federal fire entities are equipped to fashion objectively and judiciously a coherent policy to reduce the Nation's fire loss.

REDUCING THE NATION'S FIRE LOSS

There are many approaches and strategies available for reducing the Nation's fire loss. The following assortment of factual statements, often cited in discussions of America's fire problem, convey the complexity of fire and the wide range of "pressing needs" or "promising solutions" that many feel demand attention:

1. Sprinklers: "Excluding deaths caused by explosion or flash fire, there are no known occurrences of multiple loss of life in a fully sprinklered building due to fire or smoke." -- U.S. Fire Administration 7/

2. Smoke detectors: ". . . data show that when a fire occurs, the risk of dying in a home where detectors are not installed is twice the risk in homes where detectors are installed." -- USFA 8/

3. Arson: "Experts have estimated that the incidence of arson in this country has tripled or quadrupled in the past decade. . . In terms of losses, arson is fast becoming the leading crime in America." -- Richard Bland 9/

4. Firefighter safety: "Deaths and injuries suffered by the Nation's firefighters continue to be the highest of any occupation." -- International Association of Fire Chiefs 10/

5. Toxicity of burning materials: "Most fire deaths occur in homes from either smoldering combustion or a large flaming room fire.

7/ Federal Emergency Management Agency. U.S. Fire Administration. An Ounce of Prevention. Washington, 1983. p. 51.

8/ U.S. Fire Administration. Fire in the United States. p. 176.

9/ Bland, Richard E. Toward a State Level Strategy for Destructive Fire Control. Office of Fire Safety Services, Pennsylvania Emergency Management Agency. Jan. 15, 1983. p. 29.

10/ Statement of Charles Kamprad, International Association of Fire Chiefs. In: U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Earthquake and Fire Act Authorization. 98th Cong., 1st Sess., March 15, 16, 1983. Washington, U.S. Govt. Print. Off., 1983. p. 286. [Hereafter referred to as Subcommittee on Science, Research and Technology, Fire Act Authorization]

Eighty percent of these deaths are due to the inhalation of smoke or hot gases and are not a result of burns." -- Center for Fire Research 11/

6. Fire-safe cigarettes: "More than a third of all Americans killed by fire die in fires ignited by one common source: cigarettes . . . . In 40 percent of these cases, those who died were not smoking and were not responsible for starting the fires. The available data indicates that cigarette-ignited fires are far and away the leading cause of fire deaths in the United States." -- Senate Committee on Governmental Affairs 12/

7. Alternative heating fires: "While [portable heating] fires account for only 2 percent of all structure fires, the chances of dying should such a fire occur is four times greater than in the average fire ." -- USFA 13/

The array of approaches and problem areas suggested by the above statements are by no means complete. Other fire issues involve: building codes and standards, flammability of clothing and furniture, rural fire protection, emergency response management, transportation fire hazards, and many others.

On which fronts, then, can the fire problem be best attacked, and in which areas should federal emphasis be placed? Obviously no single approach offers a straightforward "cure-all." The fire problem reflects the complexity of American society, and there are countless tradeoffs and complicating factors to be considered when contemplating a comprehensive fire loss reduction strategy.

11/ U.S. Dept. of Commerce. National Bureau of Standards. Center for Fire Research. Further Development of A Test Method for the Assessment of the Acute Inhalation Toxicity of Combustion Products (NBSIR 82-2532), June 1982. Washington, 1982. p. 1.

12/ U.S. Congress. Senate. Committee on Governmental Affairs. Cigarette Safety Act of 1984 (Senate Rept. 98-597); report to accompany S. 1935, 98th Cong., 2nd Sess., Sept. 10, 1984. p. 1.

13/ Federal Emergency Management Agency. United States Fire Administration. Preliminary Fire Statistics for 1983. Washington, 1984. p. 17.

Fire prevention versus fire suppression is perhaps the classic tradeoff question discussed in the fire community. Should efforts be focused more on properly reacting to, responding to, or putting out a fire; or on preventing a fire before it gets started? Of course, prevention is desirable, but given the fact that human carelessness is responsible for most fires, can prevention efforts be successful enough to reduce the need for an expanded suppression capability? Obviously, both are critically important; it is not an "either-or" proposition, but how should the question of "suppression vs. prevention" influence priority-setting when assigning relative emphasis to different fire reduction strategies?

Within the two generally cited categories of "suppression" and "prevention" are additional variables and questions which further cloud the picture. After a fire starts, many factors can mitigate its growth and effect. These include automatic suppression and detection systems (sprinklers and smoke detectors), an adequate emergency response capability (fire departments), people's ability to react intelligently in a fire situation, and building construction designed to control the spread of smoke and flames.

Fire prevention also offers differing approaches. To prevent a fire, is it more feasible to change people's behavior, or to change the physical environment (furniture that won't ignite, cigarettes that won't smolder) so that people are less likely to start fires in spite of their carelessness?

Modifying the physical environment is hardly straightforward either. A typical fire death scenario usually involves a carelessly dropped cigarette smoldering in a chair or sofa which produces the smoke and toxic gases that kill the occupants sleeping in another room. Which component of the scenario should be altered, the cigarette or the furniture? Further tradeoffs come to mind. A properly maintained and installed smoke detector, a sprinkler system, and/or occupants who are fire safety conscious could also prevent the deadly scenario.

Target groups are another complication which must be factored into fire loss reduction strategies. Fire strikes all segments of society. A particular approach which might work for one group may not work for another. For example, despite the demonstrated effectiveness of smoke detectors on the general public, they are less likely to help high-risk groups such as senior citizens and young children. These groups are less likely to hear and understand the alarm, and they have a limited capacity to escape a fire. Another high risk group is low-income communities. Often this group lacks the means to purchase, install, and maintain automatic supression and detection equipment.

Besides tradeoffs and target groups, there is yet another factor which complicates fire policymaking. Many of the approaches and strategies available for reducing fire loss touch on highly controversial issues which could significantly affect major industries such as tobacco or plastics. Behind others are a variety of groups, all vying for federal support for their particular solution to the fire problem, which more often than not, reflects the special interests of their constituencies. Thus the setting of an objective and comprehensive federal fire policy can be complicated by the controversies, and often conflicting interests, of the fire community.

An examination of two particular fire loss reduction approaches--installing sprinkler systems and controlling the toxicity of burning materials--can provide a good example of how fire protection strategies are complicated by the kinds of factors discussed above. The Federal Government is involved in both areas. Sprinkler systems are a mostly developed technology and the USFA conducts programs designed to promote their application. The CFR performs basic research on the toxicity of burning materials; the issue is highly controversial and the phenomenon is poorly understood.

Much broader in scope than combustion toxicity or sprinklers are the more generic areas of fire research and public education. These will also be discussed, since they hold implications for all of the specific approaches listed earlier.

Sprinklers

According to Harry Shaw, former Acting Administrator of the USFA, "The residential sprinkler system, working off the domestic water supply is probably the ultimate answer to residential fire protection." 14/

Sprinkler systems have been used in the United States for over one hundred years, primarily in commercial buildings. But because 80 percent of all fire deaths occur in private residences, a Federal effort has been and is being made to develop and promote residential sprinkler systems using a highly sensitive quick response sprinkler head which will activate before lethal amounts of smoke and heat accumulate in a fire. The USFA has worked with the private sector to

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14/ U.S. Fire Administration. Ounce of Prevention. p. 5.

successfully develop a residential sprinkler system that can be built into new homes or installed in existing ones.

The problem is cost and incentive. The USFA estimates that the cost of a residential sprinkler system is one to two percent the cost of a new home. 15/ Homeowners lack motivation and the necessary awareness of the fire problem to spend the many hundreds of dollars necessary to retrofit their homes. Likewise, many developers and builders are more willing to accept fire risks than pay for installation, maintenance, and repair of sprinkler systems. Proposed economic incentives for promoting sprinkler systems are "trade-offs" or regulatory building code concessions which would allow less restrictive fire protection requirements for construction in exchange for sprinkler installation. Controversy exists as to whether the result of these trade-offs would be a building which is equally (or more) fire safe. Significant trade-offs could include reductions in fire resistance ratings of structural building components, or the elimination of compartmented construction in certain types of occupancies. 16/

The USFA is currently conducting research with the National Association of Home Builders (NAHB) to examine these tradeoff issues and to develop a model for cost/benefit analysis which can be applied to several standard types of construction. Other components of USFA's residential sprinkler program include research on installation standards for fast response sidewall sprinklers, local fire tests, regional and local demonstrations, and retrofit demonstrations.

15/ U.S. Fire Administration. Fire in the United States. p. 180.

16/ Barris, James P. and Dario L. Conte-Russian. Sprinkler Trade-offs: Are They Justified? Fire Journal, May 1980. p. 64.

The impact of sprinkler systems could conceivably affect other fire protection areas apart from building codes. For example, in 1980 the city council of San Clemente, California confronted a limited municipal budget for its fire services because of the tax reforms of California's Proposition 13. A tradeoff was made: less spending for fire services in exchange for an ordinance requiring sprinklers in all new homes. This was one of the first compulsory sprinkler ordinances in the country. 17/

It must be acknowledged, however, that the tradeoffs and fire reducing approaches taken in one community do not necessarily translate to other communities. For instance, San Clemente is an affluent community, whose population could presumably bear the added cost of sprinkler installation. What kind of tradeoffs, measures, or incentives would be necessary to promote the installation of sprinklers in an aging, crowded tenement building in an inner city?

Although the ability of sprinklers to reduce fire loss is undeniable and straightforward, complexity and controversy creep in when one confronts the problem of how to put these devices into people's homes. Much research remains to be done on tradeoffs. How much will the addition of sprinkler systems to a particular environment outweigh the subtraction of other fire protection approaches?

Toxicity of Burning Materials

All burning materials, whether natural or synthetic, produce carbon monoxide (CO), which is the toxic gas most responsible for

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17/ The Journal of Commerce. Combating Fire Losses. Feb. 19, 1980. p. 4.

fire deaths. However, many synthetic materials and plastics produce significant amounts of additional toxic gases during combustion or pyrolysis (heat decomposition). Burning polyvinyl chloride, for example, produces hydrogen chloride gas, while polyurethane generates hydrogen cyanide.

Meanwhile, plastics have become increasingly popular as building materials. According to Predicasts, a Cleveland based marketing research firm, the percentage of plastics used in all building materials rose from 2.2 percent in 1967 to 10.2 percent in 1981. Predicasts estimates that plastics' share of the building market will be worth $18.4 billion by 1990. 18/ Fierce competition between the plastics and metals industry for markets such as electrical wiring conduits has fueled the debate on toxic hazards of combustion products.

Some interests claim that the increased use of plastics in buildings constitutes an extraordinary threat to life because of the toxic gases these synthetic materials emit during combustion. Combustion product toxicity tests performed at the University of Pittsburgh show that, on the average, smoke from synthetic polymers is at least five to six times more toxic than smoke from wood and that smoke from synthetics will kill twice as fast as wood smoke. 19/ Additionally, it is charged that plastics (which are hydrocarbon based) behave like "solid fuel," burning much hotter and faster than other materials.

18/ Green, Charles. Plastics Fire Hazard Issue Aired. The Journal of Commerce, May 18, 1983. p. 22B.

19/ Ibid.

Others argue that regulation of plastics as building materials based on combustion product toxicity may be premature, if not completely unnecessary. While conceding that plastics produce certain toxic gases that other materials do not, they assert that it is uncertain whether any special toxic hazard exists from plastics, since carbon monoxide is produced in sufficiently lethal quantities by all burning materials.

On a more general level, it is argued that assessing the fire safety of a material based only on its toxicity is misleading; a meaningful approximation of a material's fire hazards must address many other factors and properties in addition to toxicity. These include: ease of ignition, volume of smoke generation, rate of heat release, flame spread, and rate of burning. Tradeoffs must be considered when judging the relative fire safety of a particular material. The question has been raised—what is more hazardous: a material that ignites slowly, burns slowly, and gives off harmful gases; or a material that ignites and burns quickly (thus causing the fire to spread faster), but gives off relatively non-toxic gases? Polyvinyl chloride (PVC), for example, burns very quickly and evolves deadly hydrogen chloride gas. But it must be exposed to an open flame to ignite, whereas cloth or wood can be more easily ignited by a smoldering cigarette.

Another argument used to counter the attacks on plastics is this: despite the increased use of plastics in buildings, fire deaths have actually decreased in recent years. It is further asserted that targeting plastics is a misdirection of effort towards solving the Nation's fire problem -- that focusing on such issues as public education, smoke detectors, and sprinkler systems would have a much greater impact on fire safety.

Those in favor of regulating plastics in buildings respond that the effects of burning plastics in fires shouldn't be expected to show up in statistics of fire death loss for 20 to 30 years, since most fires currently involve older buildings which contain mostly non-synthetic materials. It is also argued that the number of fire deaths has fallen mainly because the number of reported fires in the United States has dropped, and because the use of smoke detectors in the home has skyrocketed. Thus, benign effects of plastics should not necessarily be inferred from the decrease in fire deaths.

Any attempt to regulate materials based on their combustion product toxicities depends on the existence of adequate test methods. Much controversy surrounds the question over what constitutes an adequate test and whether such a test now exists. Presently, there is no consensus on any one test method that is appropriate for broad application. The CFR has developed a method which can determine relative toxicity levels of various materials. However, the CFR has made it clear that its test method is primarily intended for research and preliminary screening purposes and stresses that the method is not intended to be used alone in evaluating the fire safety of a material since additional factors must be considered for a given situation.

Since every fire situation offers a different combination of combustion factors and conditions, the problem of creating a meaningful test method in the laboratory environment is extremely complex.

Most observers agree that no test successfully recreates real world conditions and that the mechanics of combustion product toxicity require much more research. However, disagreement centers on the question of whether current tests can or should be used for regulation. Opponents argue that a standardized toxicity test requires arbitrary setting of combustion conditions. This leads to arbitrary toxicity ratings of materials, which, though reproducible, fail to apply to real-life situations in which combustion conditions vary greatly. It is further asserted that fire technologists and toxicologists do not yet know how to incorporate data from smoke toxicity tests into a total fire hazard assessment.

Proponents of toxicity tests counter that the usefulness of existing tests does not necessarily hinge on their ability to faithfully recreate real-world conditions. They point out that flammability tests and standards suffer from the same limitations, yet are used widely; flammability of mattresses and carpets, for example, are governed by Federal regulations. They claim that existing combustion product toxicity tests are good enough to enable builders, regulators, and manufacturers to draw useful distinctions among materials. At the very least, these tests could eliminate materials which are much worse than the rest, from the standpoint of toxicity.

Amid the controversy, arguments, charges, and countercharges surrounding combustion product toxicity, there are two points that almost all parties seem to agree on. One is that the fire death rate in the United States is too high and that actions must be taken to reduce it. The second point is that scientists do not yet fully understand the effect of the total fire environment on how a fire starts, spreads, and kills people.

Debate is shaped around these two general areas of agreement. Those in favor of tilting the Government machinery toward regulation may then ask the question: doesn't the immediate threat to life safety from burning plastics outweigh the objection that existing test methods are not yet fully developed? And those opposed to regulatory action can frame the question this way: if scientists determine that the total fire hazard resulting from synthetic materials is no greater than that of other materials, are we not needlessly diverting attention from other options (such as public education, sprinklers, and smoke detectors) which can much more effectively and immediately reduce fire deaths and injuries? Perhaps as scientific understanding of fires progresses, the answers to these questions will become more apparent.

Public Education

America Burning identified a lack of public awareness as one of the major causes of the fire problem. Unfortunately, the Commission's assessment of public concern about fire is as true today as it was in 1974:

> . . . the American public is indifferent to and ignorant of the heavy toll of destructive fire. The problem has not reached the American consciousness with the same force as, for example, the far less lethal problem of air pollution. . . . Indifferent to fire as a national problem, Americans are similarly careless about fire as a personal threat. There is an old saying in the fire protection field, to the effect that fires have three causes: men, women and children. It takes the careless or unwise action of a human being in most cases, to begin a destructive fire. 20/

20/ National Commission on Fire Prevention and Control. America Burning. p. 4.

Some believe that educating the public about fire offers more promise than any other approach for reducing fire loss. Dr. Anne Philips, in her minority report in America Burning, stressed that "widespread public education in fire safety principles should be our first concern" and cautioned:

> Much can be done by making clothing fire resistant and by installing automatic extinguishing systems and early detection systems . . . but man can, and does, circumvent the devices installed for his protection, painting over sprinkler heads, propping open smoke and fire doors and putting a penny in the fuse box. There is no substitute for understanding how to prevent fires and what to do when fires occur. 21/

Public awareness can often determine the effectiveness of some of the seemingly "technical" approaches to reducing fire loss that were mentioned earlier. For example, at a recent national conference on fire prevention, Mr. Armour Floyd, a fire prevention specialist in the Philadelphia Fire Department, lamented the difficulty in persuading inner city residents in Philadelphia to install free smoke detectors in their homes. 22/ A lack of awareness can also cause people to improperly install and maintain their detectors. And even if the detector is properly installed and operating, people often don't know how to escape after the alarm goes off. Thus, a technological means for reducing fire loss can be limited by people's indifference and ignorance of the fire problem.

Not everyone enthusiastically endorses public education as the primary answer to the Nation's fire problem. Some see public education

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21/ Ibid. p. 153.

22/ Floyd, Armour. Remarks delivered at the 1985 National Partnerships Against Fire Conference sponsored by the Federal Emergency Management Agency. Feb. 1, 1985.

as a fruitless exercise and point to the ineffectiveness of the seat belt campaign as an indication that no particular program can significantly alter people's behavior or cultural patterns. 23/

Federal public fire education programs were shifted from the USFA to the NFA after both were reorganized into the National Emergency Training Center in 1983. 24/ Additionally, the USFA has launched the Community Volunteer Fire Prevention Program (CVFPP) which distributes small grants ($10,000 to 25,000) to local volunteer service organizations across the country. The organizations use the grants to involve citizens, the fire service, and the private sector in developing ongoing public education and fire prevention programs.

Critics of the program, while acknowledging its benefit to the communities that receive grants, wonder how the program will raise public awareness of fire on a national level. They feel that the money would be better spent on developing a public fire education program that would be applicable nationwide. 25/

USFA officials claim that the local programs will be evaluated for generic use. They also point out that since American society is culturally diverse, it is necessary to try different public education approaches in many different local communities.

23/ Personal communication with Arthur C. Delibert, Citizens Committee for Fire Protection. Dec. 18, 1984.

24/ ISFSI. Evaluation of Programs of the USFA. p. 183.

25/ Randleman, Bill. Is it volunteerism or pork-barrel politics? Fire Chief, Dec. 1984. p. 25.

Fire Research

Research can be seen as a means of increasing an understanding of the problems and solutions related to fire. According to Dr. Jack Snell, Director of the Center for Fire Research, the purpose of CFR is "to provide underpinning knowledge, data, and information to all of those in the fire community to bring about the reduction in [fire] losses." 26/ The Center's stated objective is to supply the scientific and technical basis for reducing fire losses and the costs of fire protection by 50 percent. Besides CFR, other Federal agencies (such as the Federal Aviation Administration, the Bureau of Mines, and the National Aeronautics and Space Administration) are also involved in basic fire research. However their research is directly related to the specific missions of those agencies.

Much of CFR's work addresses many of the fire loss reduction approaches mentioned earlier. For example, CFR currently investigates fire toxicology and smoke hazards, furniture flammability, and wood stove fire safety. CFR places a major emphasis on the development of computerized models which can quantitatively describe the dynamics of fire. In testimony before the House Science and Technology Committee, Dr. Snell explained how this tool could be used to solve some of the difficult tradeoff questions of interest to the fire community:

26/ Statement of Jack Snell, Director, Center for Fire Research. In: U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Fire Prevention and Control. 98th Cong., 2nd Sess., June 22, 1984. Washington, U.S. Govt. Print. Off., 1984. p. 145.

> The problem that the . . . fire official faces now in looking at a new technology, for example the residential sprinkler is a case in point, is a very difficult one. What means does he have available to tell what the trade is going to be? Adding a sprinkler and reducing the compartmentation or self-closing doors or what have you? Many feel that no such tradeoffs should be made. To resolve those disputes, we need a means or tools for evaluating in quantitative terms and estimating exactly what the effects would be on smoke propagation, on fire development, access to escape routes and means of effective rescue. Those are precisely the tools that are in the development stage right now. They are computer based simulation models that provide quantitative means to answer precisely those types of questions. [27/]

It is believed that if the complexities of a fire scenario can be simulated in a computer model, the impact on fire safety from the many variable in a given environment could be predicted. This information could be used for structural design and engineering, in the formulation of building and fire codes, and in materials and product development.

A National Fire Research Strategy Conference was recently convened by the CFR and the National Fire Protection Association. At the Conference's first meeting in August 1984, participants included representatives from industry, trade and professional associations, academia, research and testing organizations, Federal agencies, and Congress. The Conference proposes to examine the impact that new technological approaches might have on the fire problem and the fire community. Ultimately, the Conference will attempt to fashion a planned strategy for fire research in the United States.

It is important to note that the research activities of the CFR do not involve a critical aspect of the fire scenario--human behavior.

[27/] Ibid. p. 161.

An extensive study on fire research needs conducted for the National Science Foundation found that "the most pressing need is for well-designed and well-executed research on the effectiveness of different, carefully conceived fire prevention strategies. Although fire prevention education programs are carried out in almost all communities, they are conducted without regard for experimental design and statistical evaluation." 28/

Richard Bland, former Chairman of the National Commission on Fire Prevention and Control also stressed this need and listed some pertinent behavioral questions in 1983 testimony before the House Science and Technology Committee:

> . . . the concerns of human behavior extend far beyond the human habitat. The National Commission recognized that point and recommended the structure of the U.S. Fire Administration be such as to support an appropriate human behavioral effort. That was to be an important part of the research effort within the USFA.
>
> That effort never really got off the ground and I see little in the current literature related to these issues.
>
> Among the still current questions are:
>
> What are the social parameters in increased fire incidence?
>
> Does our social and economic system have incentives for fire, and if so, how can they be affected?
>
> What information sources and methods efficiently and effectively carry fire safety messages to various sectors of our society?
>
> What are the human engineering requirements of our appliances, machines, transportation and comfort environment that can reduce misuse and abuse?
>
> How does the public perceive fire risk?
>
> These and many others deserve at least an effort toward resolution. 29/

28/ Swersey, Arthur J. and Edward Ignall. What does Fire Research Have to do with Fire Protection? Fire Journal, Jan. 1980. p. 73.

29/ Subcommittee on Science, Research and Technology. Fire Act Authorization. p. 319-320.

FIRE COMMUNITY VIEWS ON FEDERAL FIRE PREVENTION AND CONTROL 30/

The first section of this report attempts to convey the point that the Nation's fire problem is highly complex, and that approaches for reducing it can involve many difficult tradeoffs. Fire problems and solutions embrace many different sectors of society, and can adversely or favorably affect a wide array of special interests.

Studying, evaluating, and implementing the various approaches for fire loss reduction is costly; Federal entities specifically devoted to reducing the Nation's overall fire loss (i.e. USFA, CFR, NFA) are funded at levels significantly lower than what was envisioned by the Commission. America Burning recommended a budget of $153 million for the Federal fire program. Currently, the Administration is requesting for fiscal year 1986: $7.685 million for the USFA, and $11.637 million for the NFA. The Administration has unsuccessfully requested zero funding for the CFR in the past three years.

Given then a limited budget and a variety of fire loss reduction paths to pursue, is the Federal fire prevention and control effort equipped to select objectively and systematically the mixture of approaches (in terms of emphasis, direction, and funding) which can best comprise an optimum strategy for reducing fire loss?

Whether the USFA, CFR, and NFA are properly oriented to achieve such a goal, and the degree to which this goal can ever be achieved is a matter of subjective judgment. Accordingly, a cross section of the national fire community was queried by CRS, particularly on how they view the USFA as being the kind of Federal focus for fire prevention

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30/ Except where indicated, views quoted in this and the following section were obtained as responses to CRS queries.

and control as envisioned by America Burning and the 1974 Fire Act. Respondents quoted and referred to in this report represent firefighters groups, professional and trade associations, community organizations, fire protection engineers and researchers, academia, private industry, and the Federal Government. Although opinions expressed are subjective and may reflect the special interests of the respondent, a general sense can be derived of how the USFA is perceived in the fire community with which it must deal.

A Comprehensive Fire Research Policy is Lacking and Necessary

In 1974, America Burning characterized the need for some sort of coordinated fire research policy:

> There ought to be a clear set of priorities in federally sponsored research. Presently there is no group in the Federal Government looking at the total picture of fire research needs--including the physics and chemistry of fire, as well as medical, behavioral, and technological problems--and advising the budget-makers on what programs deserve what level of support. This is an important function which the proposed U.S. Fire Administration would perform. As it is now, every agency's research program is, in effect, competing for dollars with every other fire research program. 31/

A significant portion of "the total picture of fire research needs" certainly falls under the purview of the Center for Fire Research (CFR), not at the USFA. According to Dr. Jack Snell, Director of CFR, the CFR is logically suited to coordinate a national fire research policy, since it is housed in NBS, an institution specifically oriented towards research. USFA, on the other hand, is located at FEMA, an emergency response agency not specifically oriented to research.

31/ National Commission on Fire Prevention and Control. America Burning. p. 136.

CFR currently maintains regular contact with other federal agencies engaged in their respective mission-oriented fire research projects. To the extent that communication channels are open between fire researchers throughout the Federal Government, there is some level of informal coordination. CFR is attempting to expand radically the coordination of fire research through the National Fire Research Strategy Conference. The Conference's stated objectives appear to be in harmony, at least in part, with the spirit of the Commission's prescription for fire research policy quoted above. The Conference's objectives are to:

1. Assess the current status of fire research;
2. Identify factors affecting progress in fire research;
3. Review the technologies that are now available for fire research;
4. Relate needs in fire research to capabilities to fulfill those needs; and
5. Recommend a course of action that will lead to development and implementation of strategies to meet the fire research needs of the Nation 32/

It is doubtful whether CFR's role as a coordinator of a fire research plan would involve any direct budgetary influence on research priority setting. It would not, as the Commission says, "advise the budgetmakers on what programs deserve what level of support." Dr. Snell makes it clear that the Strategy Conference's intention is to coordinate fire research through a process of consensus and cooperation, not direction or coercion.

32/ Center for Fire Research and National Fire Protection Association. National Fire Research Strategy Conference. Quincy, Mass. Aug. 28-29, 1984. p. 5.

Most of the respondents agreed that America Burning's statement on a desired Federal coordinating role in fire research is still valid, and that the problem of fire research performed in a vacuum of priority still exists. Some acknowledge the role of CFR as a fire research focal point, and cite the promise of the National Fire Research Strategy Conference. Harold Nelson of the Society of Fire Protection Engineers (SFPE) presents this viewpoint:

> In summary the society feels that progress, primarily focused in the Center for Fire Research (as opposed to the USFA) has been made in the proposing and prioritizing of research needs. The objective reference[d] from America Burning has not been met. It is our belief however that the effort to bring a sense of coordination involving both private and governmental research activities as being attempted by the National Fire Research Strategy Conference can potentially attack the underlying concerns that caused the National Committee on Fire Prevention and Control to make the statement. . .

Other respondents are quick to point out, however, that the ability of CFR to coordinate a comprehensive fire research policy may be hindered by the limited institutional scope of NBS. NBS is geared almost exclusively towards the "hard sciences" and activities in behavioral sciences have been curtailed. As a result, CFR's research is oriented towards modifying the physical environment associated with a fire scenario. It does not, for example, address the problem of how to modify people's behavior in order to prevent that scenario from getting started. According to John Bryan, Chairman of the Department of Fire Protection Engineering at the University of Maryland:

> The statement [of the Commission] is still true today in a sense, there is no federal priority in relation to fire research. The National Bureau of Standards, Center for Fire Research has set their priorities within the Center. However these priorities do not consider the critical areas in medical, behavioral and operations research since these areas are not considered primary objectives within the scope of the National Bureau of Standards.

Tom Castino of Underwriters Laboratories projects a similarly cautious note when speaking of CFR and the Strategy Conference:

> The recently convened National Fire Research Strategy Conference may be able to carry out such a [coordinated fire R&D policy]; however it may not be in a position to address all fire safety concerns within all agencies of the Federal Government . . . We feel, as many in the fire field do, that the U.S. has a substantial technological base in place for mitigating the fire problem. Although there are areas of technology in need of improvement for both technical and economic reasons, we do not believe that significant reduction in fire deaths and economic losses can be achieved by purely technological solutions without considering the socioeconomic aspects of the problem.

At an initial, exploratory meeting on August 28-29, 1984, participation at the Strategy Conference was largely comprised of industry, code-making, insurance and testing groups whose products or activities could be impacted by the successful development and application of computer fire modelling technology. It must be pointed out, however, that the Strategy Conference is a new initiative, still in a preliminary stage. Conference organizers plan to expand its scope and include other groups in the fire community who have an interest in fire research. Certainly the Conference does acknowledge a broader definition of fire research than one confined to studying the physics and chemistry of ignition and the dynamics of fire growth. A Strategy Conference participant's comments presented in the conference proceedings acknowledges the need for fire research policy to reflect the complexity of the Nation's fire problem:

> Fire research is not seen to be just pure or basic research but rather all-encompassing; it must include finding solutions to the small but frequent fire problem as well as the occasional but spectacular incident. It must include the need to deal with the educational and attitudinal barriers that shape the behavior of people, not only en masse but individually when faced with fire. It must also focus on the whole question of determining the level of protection that should be provided, and on methods of

> assessment of risk that can be properly and judiciously accepted or not accepted. 33/

Whether CFR and the Strategy Conference will be able to address this "all-encompassing" definition of fire research cannot yet be judged at this early exploratory stage of the project. The Administration has proposed to eliminate CFR in FY 1986. Certainly, the elimination of CFR would abort any attempt to formulate a national direction and strategy for fire research through the Strategy Conference.

Given CFR efforts to coordinate fire research, how does the USFA fit in to the total picture of fire research needs? Respondents agree that the USFA has a legitimate role to play in both advancing specific research programs and in formulating a fire research policy, but they disagree as to whether the USFA is equipped or willing to fill that role.

Such disparate groups as Factory Mutual Research and the National Volunteer Fire Council (NVFC) are complimentary of USFA research efforts. Says Paul Fitzgerald of Factory Mutual (which receives grants from the USFA to develop the residential sprinkler heads):

> While there is no one group overseeing the Government's R & D need, both the CFR and the USFA have established clear priorities which have been mutually supportive. . . The research efforts of the USFA directly and aggressively attacked the residential loss of life problem, particularly through the development of residential sprinklers. The USFA R & D effort has been focused on the life safety issue and has been well coordinated with other USFA activities (e.g., educational and public awareness campaigns). There is no comparable effort available in the private sector.

James Monihan of NVFC presents a similar view and cites the importance of applying developed technologies:

33/ Ibid. p. 10.

> The research and development that is being performed by the USFA seems reasonably well coordinated and has good results, the most outstanding of which, I feel to be, the quick acting residential sprinklers. I do feel that it is important that the Administration not be confined to research and development stage but be permitted to carry its programs through to completion . . . .

Favorable comments such as these seem to focus on specific applied research projects that the USFA has successfully pursued (such as the residential sprinkler). Critical comments tend to cite the inability of USFA to implement an overall, general research policy. For example, Underwriters Laboratories asserts:

> The USFA has not established a coordinated integrated R&D policy for federally funded fire research. As presently constituted, the USFA would not appear to be able to carry out such a policy; there is a need for such a policy.

John Bryan of the University of Maryland echoes this opinion:

> The United States Fire Administration has not been research oriented for at least the last 2 years. The U.S. Fire Administration does not appear to have had a research and development policy since the departure of Dr. B. J. Thompson as administrator, possibly due to the extensive use of acting administrators. It would appear to be necessary and appropriate for the U.S. Fire Administration to establish research and development priorities in consultation with other federal agencies to coordinate a systematic, organized, effective and economic approach to federal supported research and development in fire protection.

Romeo Spaulding of the International Association of Black Firefighters cites political factors which limit USFA's ability to develop a research policy:

> It has been my impression that the USFA has attempted many times over the past four years to develop a coordinated, integrated R & D policy. However, it appears that prevailing attitudes among our Government and national fire service leaders have served to keep this attempt extremely frustrated. . . One of the major problems that I have seen occurring over and over in the USFA is that of identifying what research is to be done and who is going to do it at what cost. This area usually gets into some heavy politics and the result is not usually the best for the fire service or the reduction of the fire problem.

Thus far, comments have been presented which attribute "fire research" and "fire R & D policy" to both the USFA and the CFR. A distinction must be made between the type of research activities each agency is equipped to perform, and the nature of their respective roles in forming a research policy. While research at the CFR is basic and directed towards the chemistry and physics of fire, the research at USFA tends to develop and apply established technologies like residential sprinklers or improved firefighter clothing and equipment. A need to link these two different types of "research" was identified at the National Fire Research Strategy Conference: "The Federal Emergency Management Agency is also seen as having a major role, particularly in the transfer of the results of research to field applications."34/

In a sense, then, the USFA is seen as playing a role at the very end of the research cycle--taking established technologies and applying them to the "real world." But in another sense, some see the need for the USFA to figure prominently at the very beginning of the research cycle. To this end, "research" is seen on a much more general level--it is the studying and evaluation of what the fire problem is, which areas need attention, and which fire loss reduction approaches would work best.

Phil Schaenman, former Associate Administrator of the USFA, acknowledges that while CFR is in the best position to set a detailed fire research policy, there should be coordination above CFR regarding where research efforts should be directed. According to Schaenman,

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34/ Ibid. p. 8.

this higher coordination used to be done at the USFA. A fire research policy should be one component of an overall fire protection policy, and says Schaenman, such an overall policy should be based on a systematic evaluation of the fire problem and an objective risk analysis of fire loss reduction strategies.

Richard Bland, former Chairman of the National Commission on Fire Prevention and Control, confirms that "the coordinating and integrating function envisioned by the Commission for the USFA was to be the cornerstone of the Federal fire program." To effectively guide research directions, Bland cites the necessity for the USFA to have "a capacity to develop and assimilate a knowledge base (R & D)." According to Bland:

> The fundamental problem remains a lack of statistically valid fire experience structured, gathered and analyzed as a research and policy guidance instrument. The design and execution of a comprehensive data system is absolutely necessary for effectively identifying and addressing knowledge gaps; hopefully, the result would provide for USFA leadership in solving the fire problem.
>
> Putting such a system in place and establishing its validity will be no small data gathering and analysis undertaking; it will take time. An important ingredient will be timely arrival of "thoughtful and trained observers" at the incident locally. The control of the data system must be closely held within USFA if resulting policy is not to be biased.
>
> Until a data system is developed the engineering and science as proposed by NBS/CFR is a best guess. Perhaps an advisory committee to USFA from the industries and professions could be constructive.

Thus, the more accurate and comprehensive the fire data, the easier it is to systematically and objectively identify approaches which will most effectively reduce fire loss.

The USFA is Perceived as an Agency Primarily Oriented to the Fire Service

All respondents viewed the USFA as being primarily oriented to the fire service, which by virtue of its mission is historically geared more towards fire suppression than fire prevention. Underwriters Laboratories presents a typical view:

> There is validity to the assertion [that Federal fire protection efforts have been tipped more towards fire suppression] but that is to be expected, given the present make-up and organization of USFA and in view of the fact that the major thrust of their current efforts is working with fire departments and those associated with fire suppression.

It is also stressed that the National Fire Academy embodies the orientation towards fire suppression forces. Richard Bland explains:

> There is a validity to an assertion that the U.S. Fire Administration program is tipped toward the U.S. Fire Academy and that the Fire Academy is oriented toward the fire suppression forces. That began when the U.S. Congress bought campuses and appointed fire suppression personnel as administrators and Academy personnel; that was assumed to be a considered choice. Suppression is a spectacular engineering effort and the Fire Department is highly visible and active in responding. As a result, fire departments must be recognized as influential political and social entities; firefighters have been politically active at all levels of Government for more than 200 years.

Whether the USFA and the NFA's orientation towards the fire service is appropriate remains a matter of opinion. Mr. Bland acknowledges the importance of the NFA to the fire service but cites a need to expand its activities to the entire fire community:

> An important function of the U.S. Fire Academy is to provide the organized fire suppression services with information; they are at risk and are the first responders to incidents. But of equal importance is providing information to the total fire loss management community. Within it are architects, engineers, materials experts, code enforcement officers, construction tradesmen, researchers, burn specialists and elected public officials. The Academy staff has little representation from these disciplines.

Fred Ringler of People's Firehouse Inc., a community based organization involved in arson and fire prevention issues, stresses the need for more community involvement in the fire program. He depicts a very critical picture of the fire service bias he perceives within the USFA:

> The USFA is heavily influenced by the national and international fire protection and research establishment which is dominated by the fire services. As a result, fire service representatives are privy to budget meetings, access to decision makers, input into the development and implementation of projects and programs, and have influence by nature of their proximity to the decision makers to changing program directions and priorities. They are truly insiders to an otherwise closed process. The USFA is dominated by staff from the fire services who have little expertise in program management, monitoring or evaluation. . . no one sector should control a national fire program dedicated to the prevention and control of fires in our communities. The perception that only "professionals" understand the fire problem is a myth that has been perpetuated for too long. This type of perception must be eliminated to insure a truly integrated and effective approach to preventing and suppressing fire.

Running counter to this argument is the belief that the USFA and NFA should be oriented towards the fire service because the fire service is more intimately acquainted with the Nation's fire problem than any other group. Ed McCormack, Executive Director of the International Society of Fire Service Instructors advanced this argument in a November 5, 1984 letter to USFA Administrator Clyde Bragdon:

> The major fire service organizations in this country which represent the members of the fire community, two million strong, have fought long and hard for the creation of, salvation of and increased funding for a cost effective Federal Fire Program. . . These same organizations . . . know best what the problems are and what must be addressed to reduce the nation's fire and burn problem. It is these same organizations that know best what the solutions are and still the same organizations which can most cost effectively put the expertise of their membership to work in providing these solutions. It is strongly urged that Federal fire dollars be first made available to those organizations and

> agencies that can immediately and cost effectively address the fire problem. Experimenting with or training others to do what others already know how to do and in fact do well is not cost effective.

It is also argued that the fire service is becoming more and more involved in fire prevention and a total fire loss management approach. Thus, the orientation of the USFA and NFA towards the fire service does not necessarily mean an orientation towards fire suppression alone.

Related to the perception that the USFA is oriented towards the fire service, is the belief that the reorganization of the USFA from the Department of Commerce into FEMA has adversely affected the agency's ability to function as an entity in the Federal Government which can view the Nation's fire problem in its entirety. Richard Bland assesses the reorganization within the context of the Commission's original intentions for the USFA:

> The National Commission recommended an administrative level for the USFA. That was a deliberate decision intended to:
>
> 1. provide for budget support at a cabinet level;
> 2. provide a recognized vehicle for communicating at departmental levels;
> 3. assure an influence within the parent department and in paralleled departments; and
> 4. place the focal point in a department where program impact was measurable (Housing and Urban Development or Commerce).
>
> The reorganization violated most if not all of these intents. The solution to America's fire problem is neither another, a higher trained, a larger, nor a better planned emergency response; that point seems brushed over at all levels of government.

Others, including Harold Nelson of SFPE, John Bryan, and James Monihan of the NVFC also address the end result of reorganization. According to SFPE:

> From the view of the Society the U.S. Fire Administration has repeatedly retrenched with each of the several reorganizations and reassignments of personnel. It has changed from a broad overview agency to a subordinate organization primarily (though

> not totally) concerned with the specific needs of fire departments particularly those from small and medium size communities. Initially the Society had enthusiastic contact with the USFA (then NFPCA) and an expectation of advances in technology. Presently they are not a factor in the engineering sphere. This is in no way to detract from the work that was initiated in one of their earlier phases that encouraged and funded much of the development of the fast response sprinkler head.

John Bryan is more blunt:

> Reorganization of the U.S. Fire Administration into FEMA was the beginning of the end of the U.S. Fire Administration as an efficient, effective, and accomplishing organization. Every aspect of the agency has been diminished since this reorganization . . . The consolidation of the U.S. Fire Administration into FEMA was based on political considerations and not operational or management attributes.

And James Monihan adds:

> Unfortunately, I do feel that reorganization of the USFA into FEMA has diminished the prominence and effectiveness of the Administration. It was only 1982, in fact, that FEMA decided to zero fund and effectively eliminate the USFA and the remnants of what remains after that reorganization are extremely small. The existing leaders of FEMA have been very supportive and respectful of the fire programs, though it was only after Congress reinstated the USFA in 1983 that this respect was engendered. Our concern is that future leaders of FEMA may not be so cooperative but may be more effective in the elimination of the USFA.

There seems to be a widely held view in the fire community that the reorganization of USFA into FEMA reduced the agency's effectiveness. What remains unclear, however, is the extent to which this reduction in effectiveness was due to the turmoils associated with an institutional reorganization, or to placement of the Federal fire prevention and control entity into an agency devoted to emergency response.

A Federal Role is Necessary in Fire Prevention and Control

America Burning stressed that while fire prevention and control should remain a primarily local responsibility, a Federal role in fire prevention and control is needed. All respondents seem to agree with this assertion, and many identify research and development as an activity for which the Federal Government is uniquely suited. Factory Mutual cites the importance of Federal initiatives in addressing the residential fire problem:

> Past history strongly suggests that without Federal initiaives and leadership, there will be little research done to attack non-industrial fire problems. Because of cutbacks in local level fire department funding in many parts of the country, it is unlikely there will be substantial improvement in the future. Even if local initiatives were to develop, without the central focus point provided by the USFA, they would likely be diverse in nature and not as productive as has been the history demonstrated by the USFA's residential sprinkler program.

SFPE adds that local governments and private industry are limited in the kinds of research they can perform:

> It is the observation of the Society that local governments seldom have the resources or facilities to undertake any lasting fire research. While some important work has been done by communities such as Los Angeles and New York City it has been sporatic and widely spaced in time. Generally it has also been very pragmatic in that it solved a particular problem at hand but produced little basic technology that could be confidently transferred to other situations.
>
> Important work has been done by the private sector. Most of this however has related to protection of the large investments of the private sector in productive capabilities, physical investments, and stored stock. The private sector has little incentive to invest its resources in research that is primarily directed at protection of life or other general safety considerations. Historically these areas of fire safety research have been concentrated in the Federal Government.

Again, a distinction must be made between the types of research referred to. SFPE is addressing the type of basic fundamental research conducted at CFR. CFR performs much of this research in-house, and also funds work done at universities. Factory Mutual is referring to USFA applied research activities. USFA's primary mode of operation is to contract out projects to various sectors of the fire community. For example, John Gerard of the National Fire Protection Association, sees the USFA as a "broker" of programs and a "clearinghouse" of information. USFA staff is positioned more towards managing programs than actually conducting the programs themselves.

Some see this mode of operation as fully appropriate given the size of the USFA staff (only 16 full time professional employees), the emphasis in the Fire Act on a federal program which supports and reinforces State and local fire protection efforts, and the prevailing philosophy in the current Administration that encourages joint private/public sector initiatives and volunteerism. USFA is applying this philosophy to its fire prevention efforts, and is currently examining ways to expand private sector support. Additionally, the Community Volunteer Fire Prevention Program and the Partnerships Against Fire Program seek to increase the scope and effectivenes of local fire prevention efforts.

Because USFA's mode of operation largely involves the funding of external projects, some observers feel that the selection process designating which research areas and approaches will be pursued may be vulnerable to political influences wielded by those groups that vie for funding. James Monihan of NVFC expresses this concern as follows:

> The Federal Government's role needs to be supportive of local, state and private sector efforts but continuity of planning is important. For that reason, it is vital for the administration to be insulated as well as possible from political pressures which can cause fragmentation of its efforts by repeatedly shifting its focus from program to program.

Fred Ringler of People's Firehouse offers specific criticism of what he views as a closed process in setting priorities for fire loss reduction approaches:

> . . . it is important to have a Federal focus that can initiate and respond to innovative and cost effective research

and development projects and to develop models for local implementation. The transfer of these models and technology is probably one of the most important reasons for USFA's existence. However, its present methods of resource allocation, lack of competitive bidding for contracts, non-existent grant policy, and methods of soliciting input into programs explains why the process does not work for some sectors and does for others. These include the fire service and research communities.

Many of the USFA programs reflect reactive perceptions of the fire problem and do not encourage outside input, feedback, or criticism. To insure its effectiveness, the USFA should continue to support reactive programs at the local and state levels because these are important at all levels. Further, USFA should make a committment to develop local initiatives, develop community based programs, and reaffirm its committment to developing public/private sector partnerships.

While limited staffing at USFA may require the extensive use of contractors, it also creates a problem in managing those externally conducted programs. USFA officials admit that because of the very small size of their staff, proper on-site monitoring and detailed, analytical evaluation of the programs they fund is often impossible.

DISCUSSION

Over ten years after the National Commission on Fire Prevention and Control issued America Burning, the Nation's fire problem, though partially reduced, still persists. Also persisting is the question: how should the Federal Government best be positioned to support and reinforce State and local efforts to reduce fire loss?

Federal fire policymakers face a formidable challenge. They must be able to sort through the many complex, conflicting, and often controversial fire loss reduction approaches; and they must be able to apply a limited budget towards composing an overall program which can most quickly and effectively lessen the fire problem. Many in the fire community seem to feel that the Commission's intended principal Federal fire entity, the USFA, is positioned in a way that makes it difficult for this challenge to be met. A criticism, often heard, is that the USFA does not possess an objective, analytical means of coordinating and setting priorities for determining which fire loss reduction approaches should be investigated and acted on.

The limited scope and stature of the USFA could be responsible for its perceived inability to coordinate an overall Federal fire policy. America Burning identified the need for a USFA with a very broad scope: "there should be an entity in the Federal Government where the Nation's fire problem is viewed in its entirety, and which encourages attention to aspects of the problem that have been neglected." Views presented earlier on the importance and relative neglect of behavioral fire research raise doubts as to whether the USFA fits the Commission's image of comprehensiveness. Behavioral research is deemed too long-term and theoretical for USFA involvement, while the CFR cannot address this need because "soft science" activities do not fall within the charter of CFR's parent organization, NBS.

The limited scope of the USFA is reflected in the fire community's perception that the USFA is primarily oriented towards the fire service. Critics wonder how this fire service orientation (in terms of both staff and focus) squares with the Commission's intention that the USFA should view the fire problem "in its entirety," and may ask if it is fitting for one particular (albeit crucial) portion of the fire community to set priorities for solving a problem that encompasses many different sectors of society.

The limited stature of the USFA is also seen as a problem. According to Richard Bland, establishing the USFA as a successful focal point for Federal fire prevention and control "will depend upon positioning USFA in a manner to establish authority. By authority is meant organization and staffing to become a recognized and respected resource for fire related information."

Many feel that the many reorganizations of the USFA have robbed the agency of the institutional maturity necessary to become a recognized and widely respected Federal fire presence, and to establish a broad-based comprehensive fire policy. In this regard, Harold Nelson of SPFE expresses a common opinion:

> Our general view on the situation at the U.S. Fire Administration is surprise that it has survived a series of reorganizations, attempts at abolishment, total restaffing, and progressive reduction in relative position and authority and still has apparently been able to perform an important function for the fire services of the Nation.

A tangible effect of the USFA's organizational turmoil has been a drastic reduction in staff size. For example in 1978, before USFA's move from the Department of Commerce to FEMA, the agency was authorized for 68 full time employee (FTE) positions (not including NFA staff). Currently there are only 20 FTE's at the USFA. Many feel that such a reduction must necessarily have an effect on agency programs. For example in 1978, USFA's national data center employed 25 people. The Fire Data and Analysis Office of today is authorized at 6 positions. It funds a data exchange agreement with the NFPA and relies on a voluntary data collection organization (the National Fire Information Council). Has this reduced in-house capability affected the quality and completeness of fire data?

A lean staff has dictated a different mode of operation for the USFA--contracting out programs instead of performing them in-house. Contracting, by its very nature, is susceptible to criticism that the process could be subject to influences from various groups vying for funding. For example, many of the community based organizations involved in fire prevention have charged that because the USFA is oriented to the fire service, contracts are mostly awarded to fire service groups. Thus, a capability to set objectively and analytically priorities in order to decide which and to what extent different fire loss reduction approaches should be pursued seems worthwhile.

Ironically, the small staff size which creates the need for a program management approach, at the same time, limits USFA's ability to monitor and evaluate the programs they fund. USFA officials also acknowledge that their small size and excessive workload (which consists of managing outside programs) limits their ability to formulate any long range fire prevention and control strategies.

There are those who defend USFA's fire service orientation. They maintain that it is appropriate for the USFA to be oriented to the fire service because the fire service is in turn oriented to reducing the Nation's fire loss. Given its limited budget and staffing, the USFA must rely on an outside network of people, and the fire service is the logical choice because its members are the most intimately acquainted with the Nation's fire problem. Also the present incarnation of the USFA is relatively new--the agency was totally restaffed in 1983. Therefore, some observers feel that a "wait and see" stance must be adopted before an accurate assessment of USFA's current effectiveness can be made.

The question of Federal involvement in fire prevention and control is as complex as the fire problem itself. Two legislative options have been discussed in the past year which are intended to better position the Federal Government's fire effort. Some groups have suggested that the Fire Act be rewritten to emphasize fire prevention and to expand explicitly its scope beyond the fire service. Others have advocated the creation of a new Commission which would critically examine the Nation's fire problem and look at how the Federal Government fits into a solution. All parties agree that fire loss is too high and that more must be done to stop America from burning.

APPENDIX — Description of USFA programs*

U.S. FIRE ADMINISTRATION

The Federal Emergency Management Agency's (FEMA) U.S. Fire Administration is divided into four Offices: Fire Policy and Coordination; Firefighter Health and Safety; Fire Prevention and Arson Control; and Fire Data and Analysis. With input from the members of the Joint Council of Fire Service Organizations, priorities were established for each of these program areas to guide allocation of the resources of the Fire Administration most effectively to meet its primary goal: Improving fire safety in the United States.

Following is a discussion of the priorities and programs for each office:

OFFICE OF FIRE POLICY AND COORDINATION

Responsible for overseeing the management and administration activities of the USFA and conducting programs which impact on fire and rescue service management practices.

Leadership Conferences

Leadership Conferences are planned for a number of groups including State Fire Marshals, Public Fire Educators, Metro Chiefs and others.

Private Sector Initiative

Initiate several new programs to broaden the participation of the private sector in fire programs. A particular emphasis will be on attracting private sector resources for local fire service programs.

Integrated Emergency Management System (IEMS)

The USFA is working with the nation's fire service on FEMA's long range strategy for improving program implementation in developing Emergency Management capabilities of state and local governments across all hazards.

Volunteer Fire Service Initiative

USFA will carry out an effort to support the volunteer fire service including activities to improve the retention of personnel at the local level and enhance volunteer fire service roles in the total fire program.

Fire Executive Fellowships

USFA is conducting a number of activities to support the development of the working fire executive roles. This will include cooperating with the National Fire Academy in the development of their Fire Executive Management Program. For example, in

* Source: U.S. Fire Administration

FY 1984, the USFA/NFA has initiated a FEMA Fire Executive Fellowship Program with Harvard University.

Coordinated National Fire Prevention Program

USFA will initiate a variety of health and safety, fire prevention and data activities to carry out a national coordinated strategy including public education, residential sprinklers, community volunteer, private sector initiatives and others. In FY 1984, the National Community Volunteer Project was initiated.

Regional Fire Representatives

Regional Fire Representatives have been established in each of FEMA's 10 regions. The USFA will utilize the Fire Representatives in a variety of supportive activities including the NFIRS Program, community based fire prevention efforts, relationships with state and local fire services and other areas.

OFFICE OF FIRE PREVENTION AND ARSON CONTROL

Responsible for all fire prevention and public education programs and responsible for mitigation of the arson problem in the United States.

The following are various projects within this office:

Community Based Volunteer Fire Prevention Program

The purpose of the Community Volunteer Fire Prevention Program is to increase the scope and effectiveness of local fire prevention efforts through a unique merger of local, State, and Federal resources through the private sector to support new and existing community fire prevention, education and protection programs.

Residential Sprinkler Systems Program

The purpose of the project is to improve the public and private sectors awareness of the benefits and technological improvements in residential sprinklers, and promote their adoption and use at the local level. Through the increased use of this technology, the level of life and property loss due to residential fires will be significantly reduced.

Juvenile Firesetter Program

This on-going project has resulted in the development of two handbooks for juvenile counselling. These handbooks help to provide guidance to personnel dealing with juvenile firesetters. A final manual and monograph are being developed and will culminate in a complete program that will offer direction for personnel when dealing with juveniles from the youngest of children through those in adolescence.

Arson Information Management System

AIMS is an on-going project that provides a balanced management format for handling arson data utilizing microcomputers. The AIMS system provides data which can be utilized for proactive and reactive strategies. That is, reactive strategies that consist of timely investigation management decisions and proactive analysis used to predict arson prone buildings or situations.

Rural Arson Project

Two projects in the rural arson area are in progress. The one deals with identifying the arson problem, suggesting strategies to mitigate the problem and finally measuring the success of those strategies. The second project is studying the feasability of using an AIMS approach in rural arson investigation. Both projects are being closely coordinated so that all information is being utilized by both projects.

AIMS Enhancement Program

The purpose of this project is to develop AIMS software that will be compatible with the most commonly used microcomputers in use by law and fire service organizations. This will allow the AIMS system to be available to the majority of both services throughout the U.S.

Sesame Street Fire Safety Program

The continuation of this highly successful [illegible] project, designed to help communities develop fire safety educational programs for preschool children, will further expand the project to include older children and also develop tools for local fire departments and other organizations to use in establishing Sesame Street Fire Safety Programs locally.

OFFICE OF FIREFIGHTER HEALTH & SAFETY

Priorities for this office include assisting in the development of improved protective clothing and equipment, enhancement of personnel safety through improved training and improving diagnostic and immediate care procedures for fire victims. Various projects within the office are:

Apprenticeship Training

Managed by the International Association of Firefighters, in cooperation with the International Association of Fire Chiefs, is a continuation of support for development and tracking of basic fire training and related work in cooperation with municipal governments.

Project FIRES (Firefighter Integrated Response Equipment Systems)

Through grants to the International Association of Firefighters, the IAFC and fourteen cities across the United States, the USFA is continuing research, development, and testing of an improved turnout suit for structural firefighting. The USFA is working closely with industry to encourage the incorporation of new innovations into commercially available equipment.

Low Profile Breathing Apparatus

The USFA will continue to work with the U.S. Bureau of Mines, the U.S. Coast Guard, and the U.S. Divers Corporation in the research and development of a long duration (2 hour) positive pressure, rebreather system. A prototype of this system is currently undergoing manned testing.

Medical Management of Victims of Smoke Inhalation

This continuing project will provide a diagnosis and treatment protocol for smoke inhalation victims based upon information derived from a clinical, e.g., emergency room setting. The American College of Emergency Physicians will publish and otherwise disseminate a resulting treatment algorithm throughout the appropriate medical community.

Firefighting Tools and Equipment Research and Development

This initiative is aimed at identifying innovative tools and equipment applicable to firefighting, modifying or improving on designs where appropriate and transferring that technology to departments across the country.

Fire Department Safety Officer's Reference Guide

An increasing number of fire departments are expected to establish fire department safety officer positions. The USFA is working with the National Fire Protection Association to develop a safety officer's guide that promises to be a valuable resource for fire department personnel with responsibilities for establishing and managing programs directed at decreasing the incidence of firefighter illness, injury and mortality.

Hazardous Materials Suit

FEMA Director, Louis O. Guiffrida, has directed the USFA to support and participate in the development of a hazardous materials suit for the fire service.

One of the critical requirements that this suit must have is that it be capable of being donned in a reasonably quick time. The suit will be fully encapsulating and should provide protection against a wide range of chemicals. Protection against the widest range of chemicals will increase the utility of a superior hazardous materials suit.

Smoke Detector Effectiveness Research Project

The primary objective of this study is to determine problems effecting smoke detectors. Specific areas of concern include: determine service life; sensitivity, and calibration of smoke detectors.

Firefighters Short Range Communication System

Through a cooperative agreement with the National Aeronautics Space Administration and the U.S. Coast Guard, the USFA is developing a hands-free communications system for firefighters.

Sidewall Residential Sprinklers

In cooperation with Factory Mutual, the USFA is performing fire test on sidewall sprinklers. The results of these tests will be made available to the concensus code organizations.

OFFICE OF FIRE DATA AND ANALYSIS

Priorities for this office are to ensure effective fire data collection on a national basis; to develop a data bank of timely, accurate and retrievable information; and to continue analysis of major and/or unusual fires.

National Fire Incident Reporting System (NFIRS)

To ensure the collection of accurate fire data throughout the United States. The NFIRS program will focus on upgrading the quality and completeness of current data.

Technical Improvement & Support

Working with FEMA's Office of Information Resources Management, the USFA is continuing to collect, process and feedback to users data on the U.S. fire problem. Initiatives in this area will be aimed at developing more useable formats for data feedback,